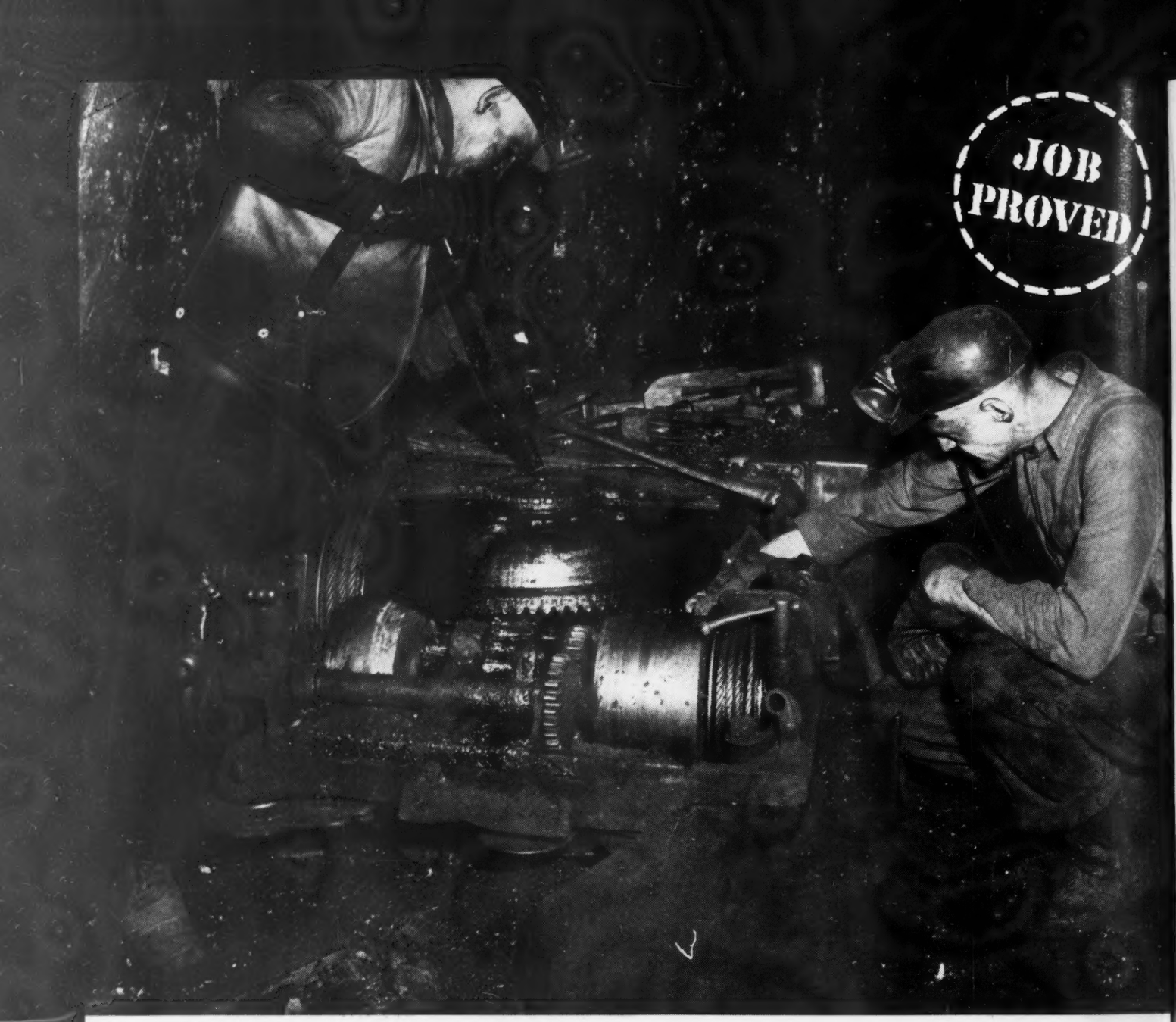
Coal Age

A McGRAW-HILL PUBLICATION DECEMBER, 1948

COAL AND WASHINGTON..p. 74



CUTS COSTS FROM FACE TO TIPPLE

To Control Soaring Costs, Coal Mine Adopts One Sun Lubricant After Another—Now It's 100% Sun-Lubricated

Trying one Sun product often leads to adoption of Sun products for every use. Take the case of a bituminous-coal operator whose profits were being whittled down by high lubrication costs. Four years ago, on the advice of one of our engineers, he tried out a Sun "Job Proved" mine car grease.

He found it the most satisfactory grease he had ever used—it lubricated better, went farther, cost less. Next he adopted Sun oils and greases for the locomotives. Later he discarded a third competitive lubricant in favor of a Sun "Job Proved" product.

Finally he was convinced Sun oils and greases meant improved efficiency for every kind of mining equipment. Today the mine is 100 percent Sun-lubricated. With Sun mine lubricants on the job the mine is enjoying the best lubrication, at the lowest cost, since the day it opened.

Here is a typical example of the advantages of Sun "Job Proved" mine lubricants. Whatever the machine, there is a Sun mine lubricant to keep it operating at maximum efficiency. For complete information, call your nearest Sun Office.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

In Canada: Sun Oil Company, Ltd.
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SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

B. F. Goodrich cord conveyor belt

Gives 2 to 6 times greater impact resistance, troughs better, lasts longer

IN the cord plies of a B. F. Goodrich belt each cord is completely surrounded by rubber — no cross threads tie them together. These parallel cords are completely insulated from one another by rubber, free to "give" lengthwise and crosswise when an impact occurs. Thus the rubber can distort temporarily to distribute and absorb shocks that would damage a stiff, unyielding carcass. This augmented impact cushion means better belt service, longer belt life.

Cord belts trough better — Cord belts carry the load with less belt damage, less material "spill." Even thick, narrow cord belts trough naturally. And because they trough better, cord belts keep centered on the idlers, sustain less damage, require less maintenance. Longer centers, higher lifts can be used. Creasing action between idlers (as in a fabric-type belt) is eliminated.

Cord belts last longer, reduce costs — The better impact cushion of cord construction resists cuts and gouges. A transverse cord "breaker" floated above and across the main cord section helps cushion impact, keeps the cover from stretching beyond elastic limits, and provides better adhesion between cover and carcass. With each cord completely sealed in rubber, this BFG belt resists the effects of acid materials, moisture, mildew.

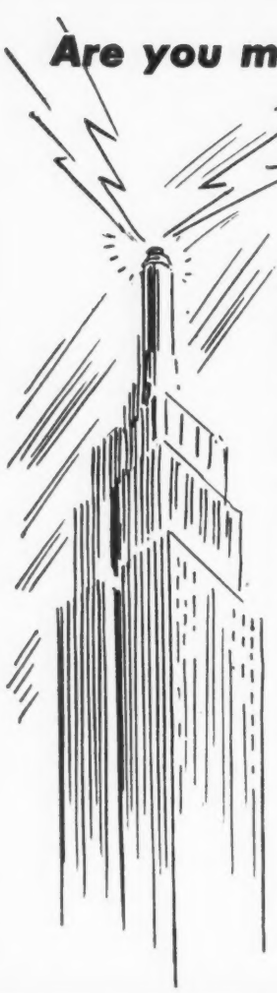
Cord belts for tough jobs — If your belts must take severe impact on loading or "over the idlers," cutting and gouging at the loading chute, exposure to moisture and acid materials, heavy loads with long centers and high lifts, you need BFG cord belts. Your local distributor will show you how they can save you money. *The B.F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

Make no mistake -

FOR INSTANCE...

Are you mistaken about LIGHTNING?



Does lightning "never strike twice in the same place"? The fact is lightning always tends to strike frequently in the same place — if it's the highest object in the neighborhood! The Empire State Building, for instance, has been struck by lightning hundreds of times.

Trouble, too, tends to strike frequently at coal mining machinery that is NOT properly lubricated. Right? There can be plenty of trouble — UNTIL YOU START USING HULBURT QUALITY GREASE! Then you won't find machines laid up in the repair shop, stricken by faulty lubrication . . . because the down-in-the-mine services of Hulburt Lubrication Engineers, plus the one-purpose QUALITY of HULBURT QUALITY GREASE, does the job RIGHT and arrests trouble . . . make no mistake about it!

HULBURT OIL & GREASE COMPANY—PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

Coal Age

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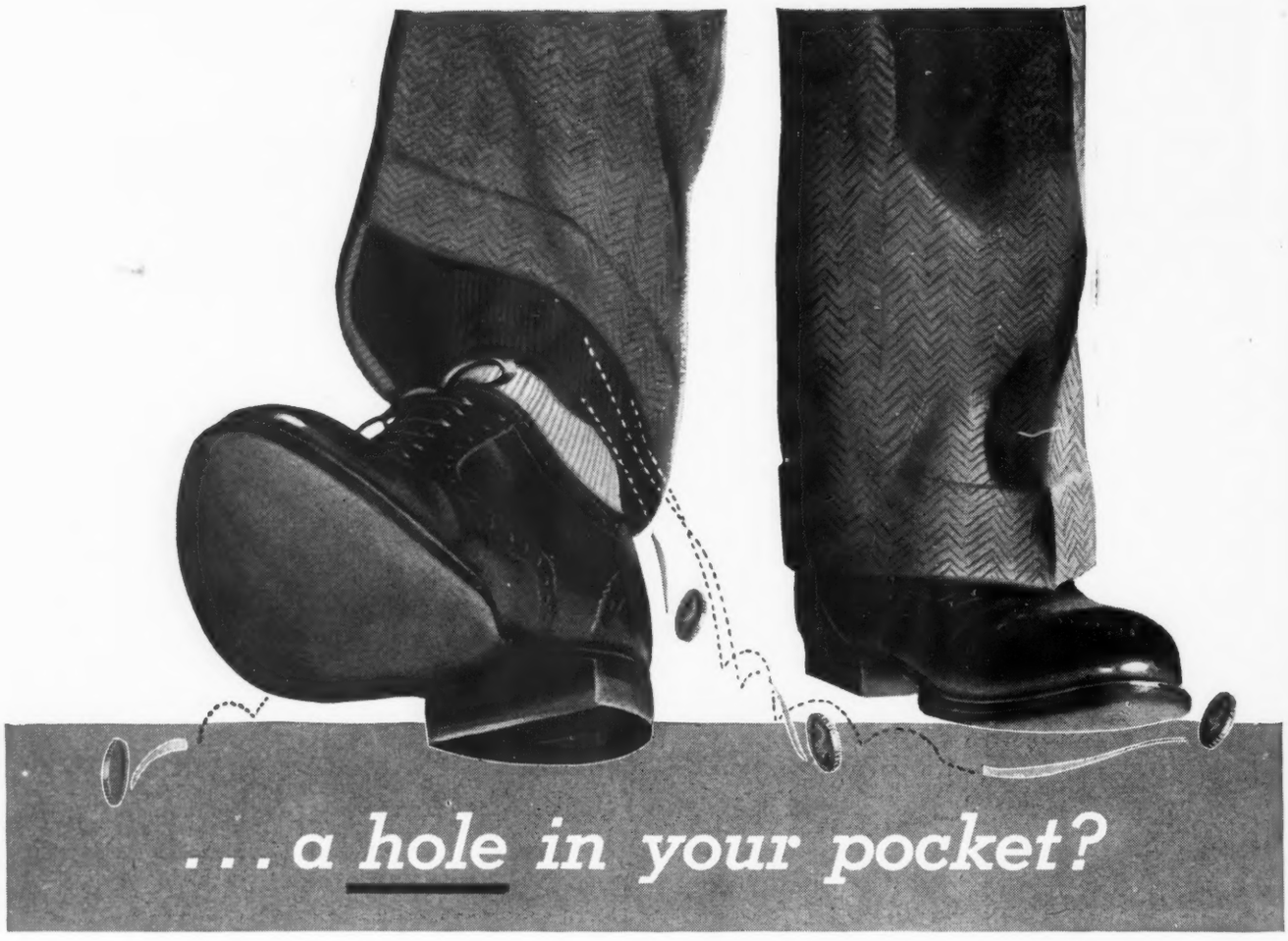
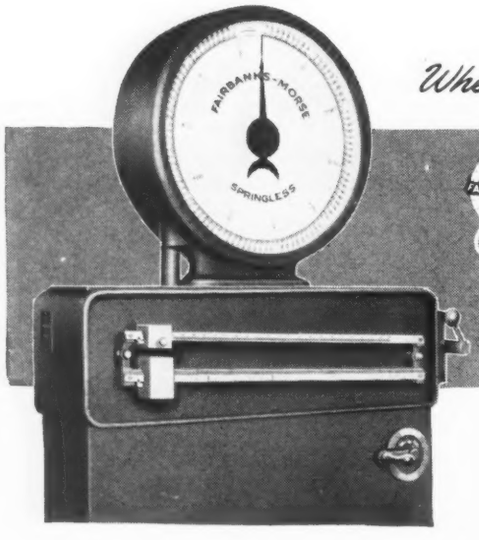


. . . a hole in your pocket?

It is easier to prevent big losses than to prevent cumulative small ones. You are always on guard against the big losses . . . small ones often go unnoticed.

Your scale may be accurate but this is not sufficient insurance that your weights are correct. From many accurate scales in service today it is difficult to obtain a quick, accurate reading. There is still chance for human errors . . . with loss of money and time. When you select a dial scale, you should choose the one which is the quickest and easiest to read. Fairbanks-Morse's unique principle of the direct reading dial in all capacities is a feature found in no other dial scale.

Why not have your local Fairbanks-Morse weighing expert demonstrate the direct reading dial principle and how it can help your operations. He will be glad to do so without any obligation. Fairbanks, Morse & Co., Chicago 5, Illinois.



When it comes to scales...

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FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • STOKERS • SCALES • MOTORS • GENERATORS
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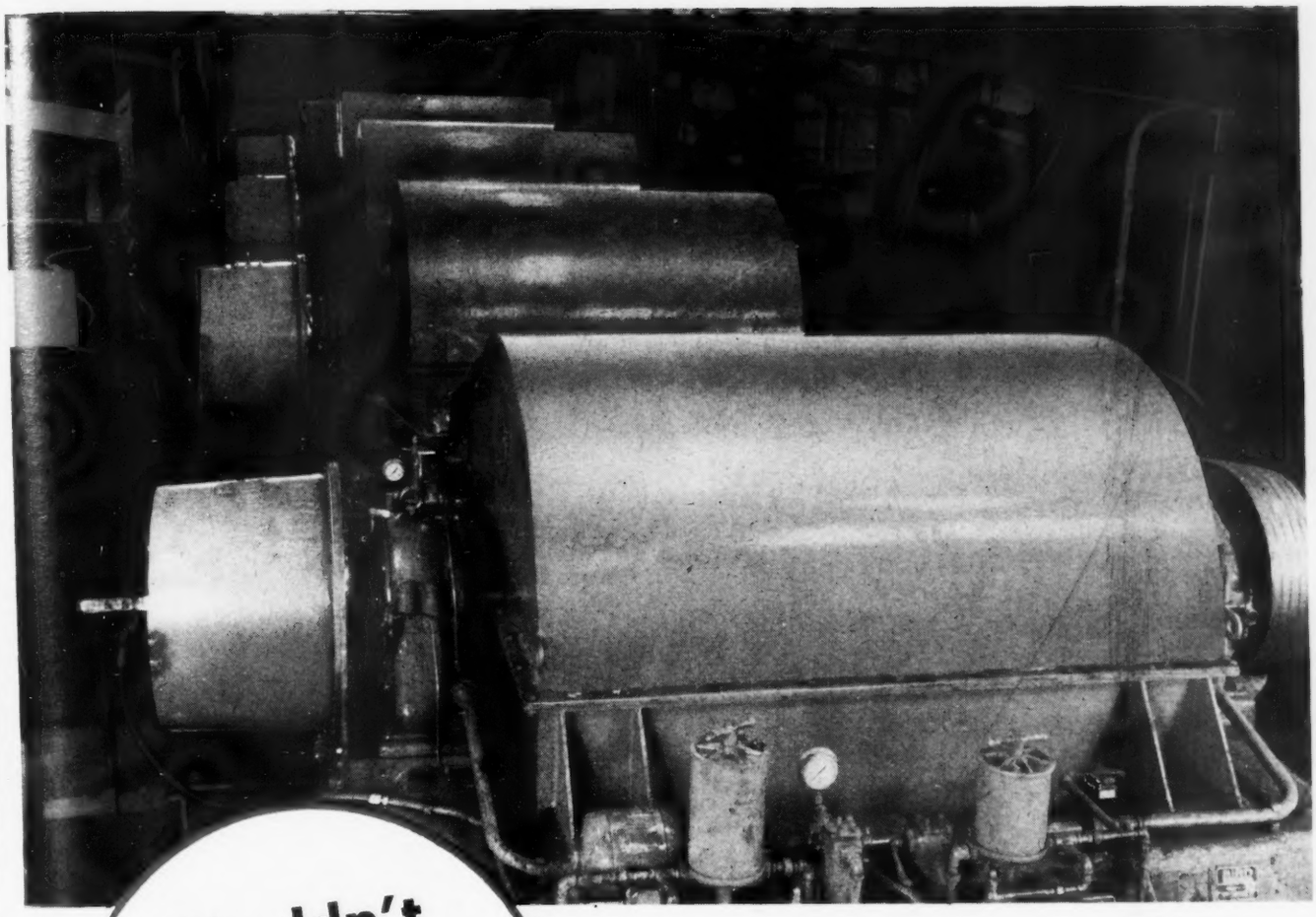


Wouldn't You JUMP at the Chance

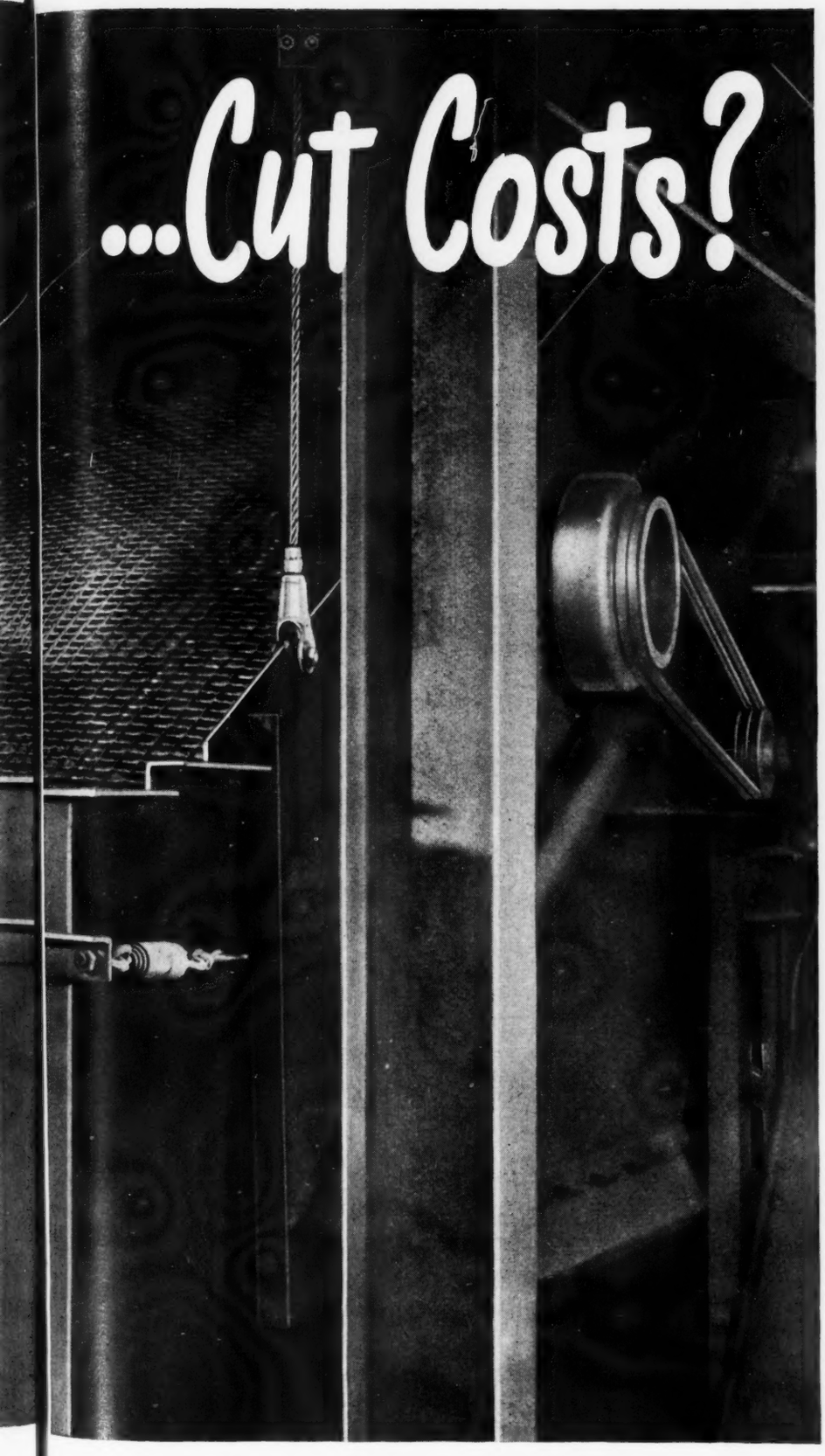
to get the water out of your fine coal in a way that gives you

- thorough, uniform moisture removal
- no waste of coal
- a closed water system

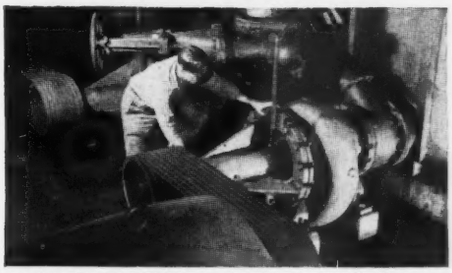
You can do just that, continuously, without shutdowns for overhaul or parts replacements for months at a time, when you're equipped with the

BIRD *Continuous Centrifugal* COAL FILTER

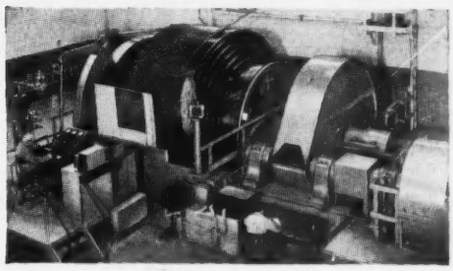
BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS



OTHER COST-CUTTING TONNAGE-INCREASING PRODUCTS FOR COAL



CW SOLIDS PUMP — Designed especially for coal washing. Has only five easily accessible working parts which can be removed without disturbing piping. Handles up to 40% solids in suspension. Allisite parts give high abrasion resistance. **Bulletin 08B6381B.**



ALL-ELECTRIC HOISTS—Allis-Chalmers builds hoists plus all auxiliaries . . . in any size . . . each installation specifically engineered for your requirements. Automatic Regulex control assures smooth operation at peak loads, low hoisting costs.

LOW-HEAD VIBRATING SCREENS—Used with reverse End-Tension Deck for dewatering small sizes of stoker grade coal and for screening and dewatering sludge . . . with side tension deck for dewatering larger coal. Sizes 3 by 6 to 6 by 16 ft. **Bulletin 07B6330A.**

A 2560

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ALLIS-CHALMERS

. . . Builds for Coal Progress!

New angle on refuse disposal

Compass Steel-Cable belt lifts 400 T.P.H. over 487-foot hill

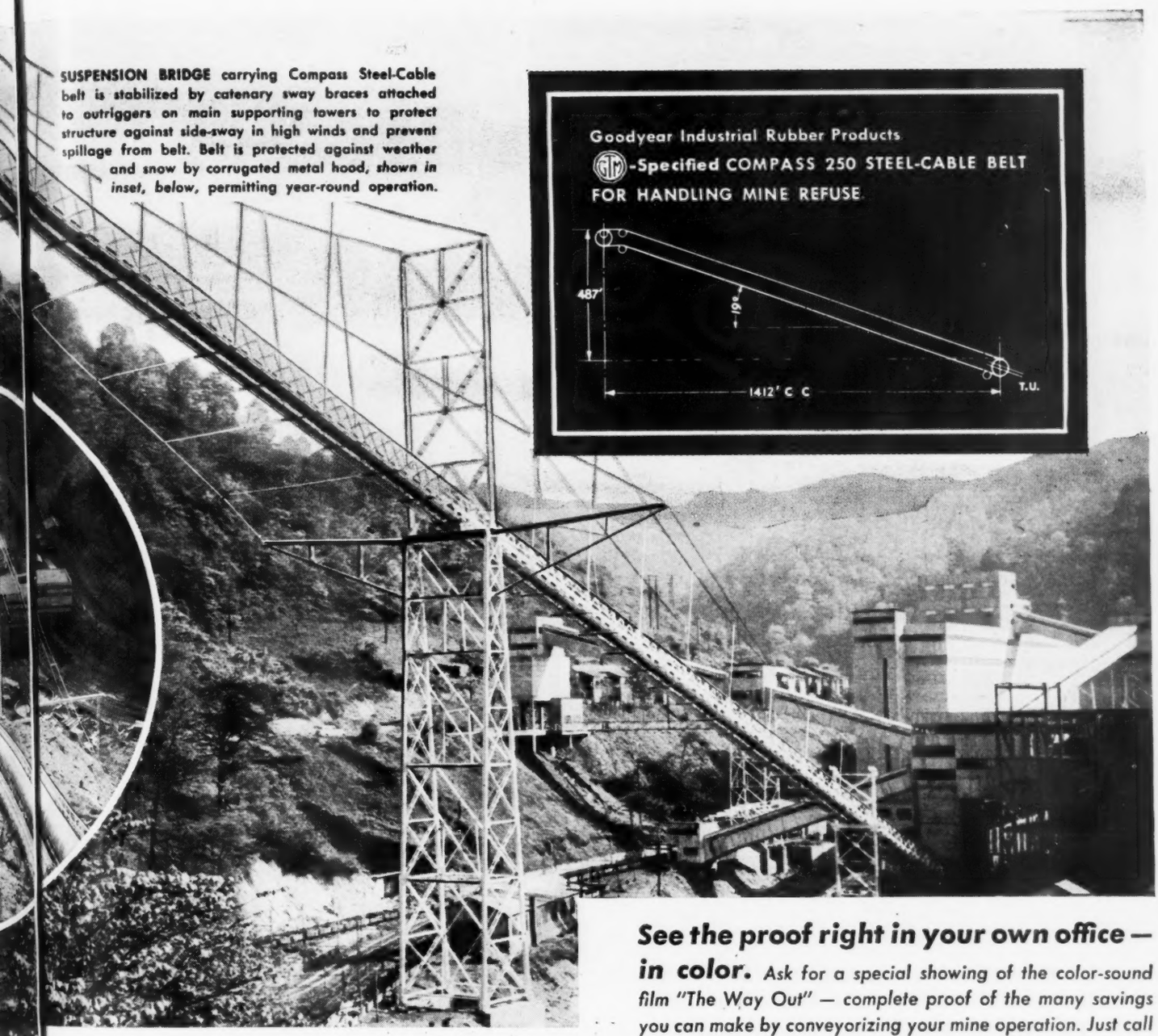
FINDING a disposal area for rock, slate and other refuse from a new cleaning plant was the problem of a large West Virginia coal company. The closest available site was on the far side of a steep hill, 1,500 feet away. Anxious to take advantage of the proven economies of conveyor belt haulage, the operator called in the G.T.M. — Goodyear Technical Man.

He was given the problem of designing a belt to run directly from the plant to the summit of the hill, supported on a suspension bridge inclined at a 19° angle. The discharge end would be 487 feet above the loading point, and 400 tons per hour would have to be carried.

To handle this heavy-duty job, the G.T.M. specified a Goodyear COMPASS 250 Steel-Cable conveyor belt, 30 inches wide, operating at 400 feet per minute. The super-strength of COMPASS steel-cable-bodied construction, which provides far greater tension and load capacity than any other type of belt, made it possible to employ a single-flight belt, on 1,412-foot centers.

When operating engineers confirmed the practicality and economy of the G.T.M.'s proposal, the installation was made. More than one million feet of finely stranded, high-tensile steel cables were used to sinew the belt which was vulcanized endless on the job by Goodyear's patented vulcanized-splice. Now in operation, it is proving to be an out-

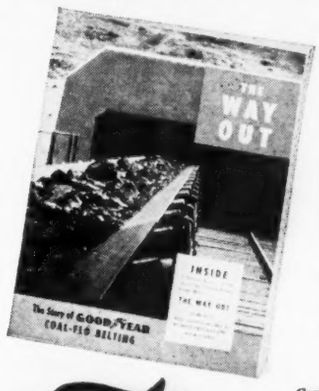
SUSPENSION BRIDGE carrying Compass Steel-Cable belt is stabilized by catenary sway braces attached to outriggers on main supporting towers to protect structure against side-sway in high winds and prevent spillage from belt. Belt is protected against weather and snow by corrugated metal hood, *shown in inset, below,* permitting year-round operation.



standingly successful installation.

The G. T. M. can draw on his detailed knowledge of conveyor belts to help you find your best answer to low-cost handling of coal or spoil, below ground or above. Ask him for dollars-and-cents figures on savings accomplished by other mines. Or write Goodyear, Akron 16, Ohio.

See the proof right in your own office — in color. *Ask for a special showing of the color-sound film "The Way Out" — complete proof of the many savings you can make by conveyorizing your mine operation. Just call your nearest Goodyear Industrial Rubber Products Distributor, listed in your classified telephone directory.*



FREE

Complete picture story of savings with belt conveyor system. Send for free copy.

Compass—T.M. The Goodyear Tire & Rubber Company

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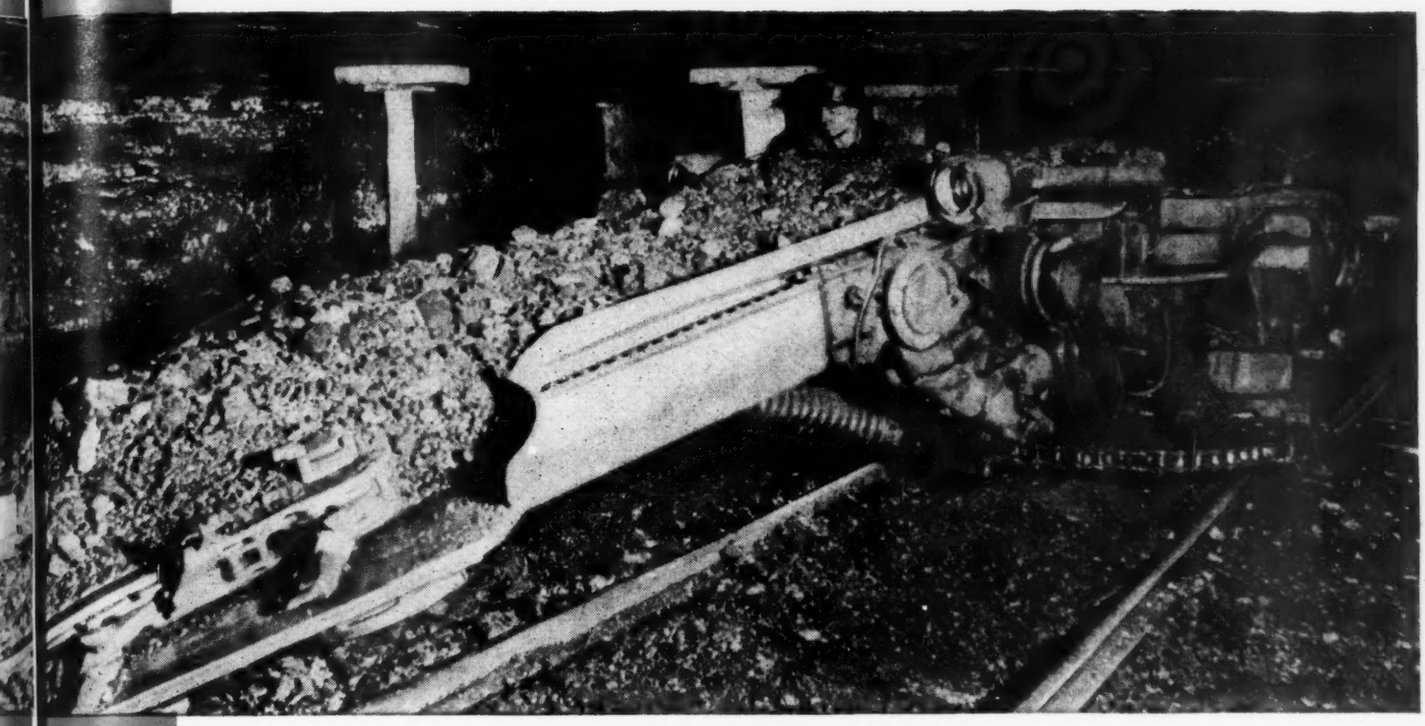
GOODYEAR

THE GREATEST NAME IN RUBBER



CHARGE your hydraulic mechanisms, underground and above, with *Texaco Regal Oils (R & O)*. The economy of using these fine turbine-grade oils will show up in smoother, more trouble-free performance . . . in longer periods between necessary drains . . . in lower maintenance costs.

Special additives give *Texaco Regal Oils (R & O)* exceptional resistance to rust and oxidation, and they have been processed to prevent foaming. Thus they keep hydraulic systems clean . . . help you avoid costly stoppages.

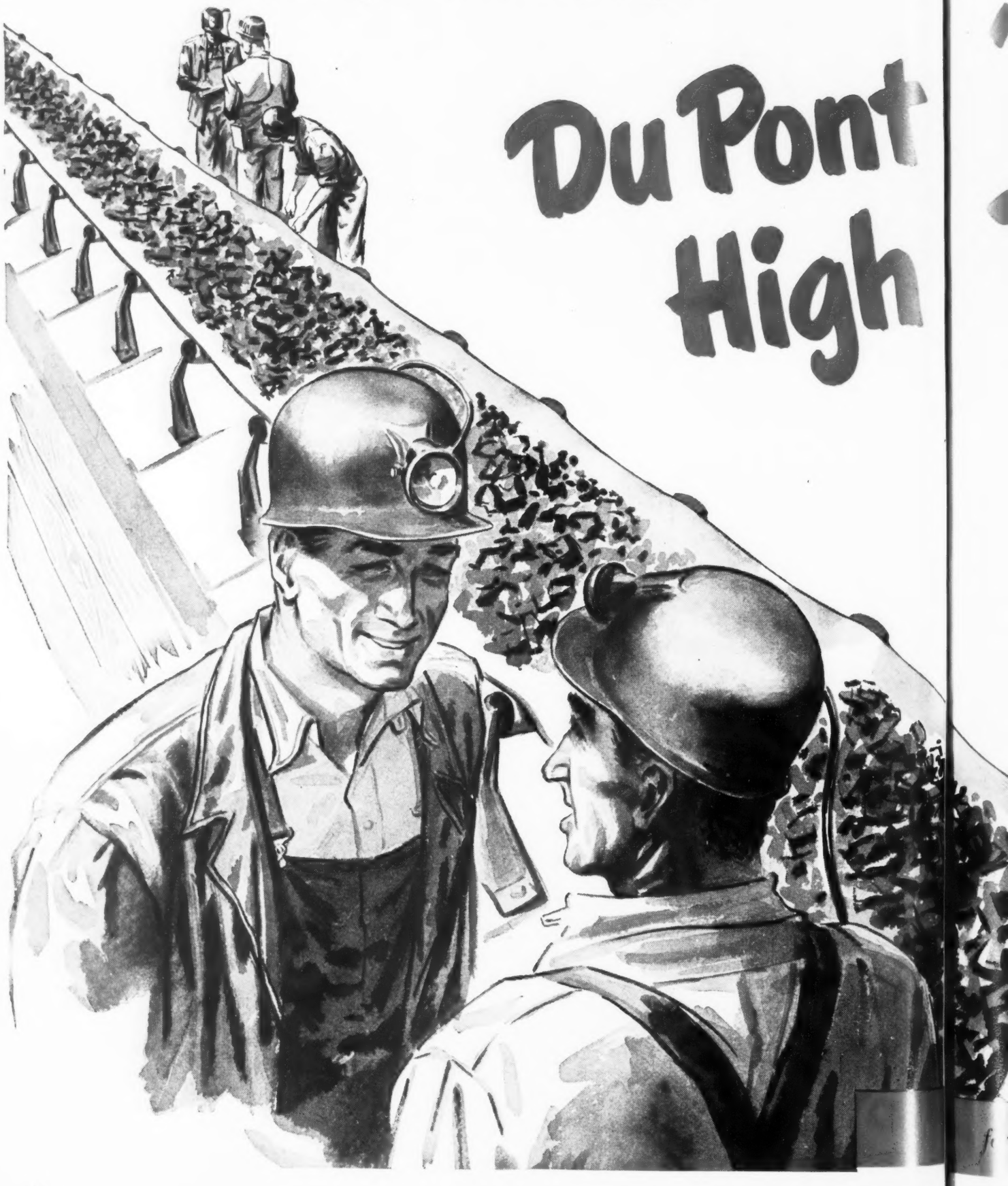
Another economy: you can get *Texaco Regal Oils (R & O)* in all needed viscosities . . . no "cutting back" is necessary. This assures uniform quality . . . uniformly fine performance . . . saves time and expense. Leading makers of hydraulic equipment recommend or approve *Texaco Regal Oils (R & O)*.

Let a Texaco Lubrication Engineer give you full details. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write:

The Texas Company, *National Sales Division, Dept. C*, 135 East 42nd Street, New York 17, N. Y.

For the Coal Mining Industry

It has gone a long way in improving conveyor belt strength



"Cordura" Tenacity Rayon

For high strength at low cost ... look into Cordura*

This man-made fiber is engineered to yield much greater strength than natural fibers. That's why "Cordura" yarn makes possible lighter belts . . . and longer belts.

"Cordura" is the same high tenacity rayon so widely used to improve tires, V-belts and hose. Now you can reap the benefits of lighter conveyor belts that are easier to carry about, install and take down. And for long-lift belts, "Cordura" provides the necessary tensile strength plus remarkable troughability and resilience.

Du Pont "Cordura" High Tenacity Rayon is a basic type of fiber that can be used in conveyor belts, no matter whether they're made of individual cords, cord fabric or woven fabric.

Next time you order a conveyor belt, ask your supplier about "Cordura." While you might expect to pay a premium for the advantages of "Cordura," it's actually your best buy in amount of tensile strength per dollar!

Du Pont will be glad to give you detailed information about "Cordura." Just write Rayon Division, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del. *REG. U. S. PAT. OFF.

DU PONT
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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

for RAYON . . . for NYLON . . . for FIBERS to come . . . look to DU PONT

50,000,000* Butt Welded Rail Bonds . . .

they *must* be good!

BF-10

BF-3

BF-1

BF-5

question:

What is the best method of attaching a flexible strand to a solid end piece so that the connection will have both the highest electrical conductivity and the greatest mechanical strength?

possibilities:

Soldering, drop forging, cold pressing, brazing, flame welding, or butt welding.

answer:

Butt Welding! Only with machine butt welding can consistent electrical and mechanical results be obtained with clock-like regularity. Only with butt welding can you be sure that in every case all the wires in the strand are electrically connected permanently to the solid end piece. Only butt welding will consistently develop full strength of the strand on a tensile test to destruction. *The butt weld is stronger than the strand!*

Butt welding has found a wide application in the art of rail bonding, and we are proud to announce that the 50 millionth butt weld bond has been produced by the industry —with more and more following every day!

What greater proof of its reliability can be had?

Specify TIGERWELD Bonds . . . they're *all* butt welded!

*Covered by Patent Numbers 2,008,786, 2,008,787, 2,023,317, 2,213,990.

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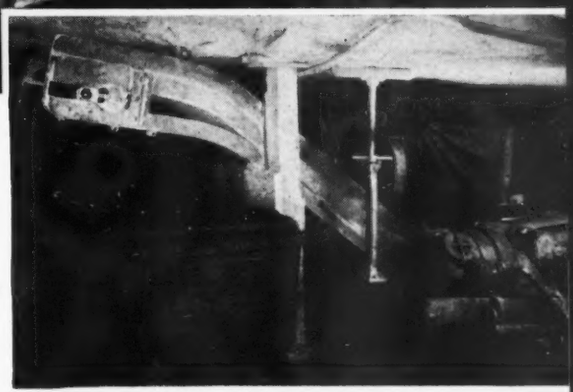
IN CONVEYOR MINING

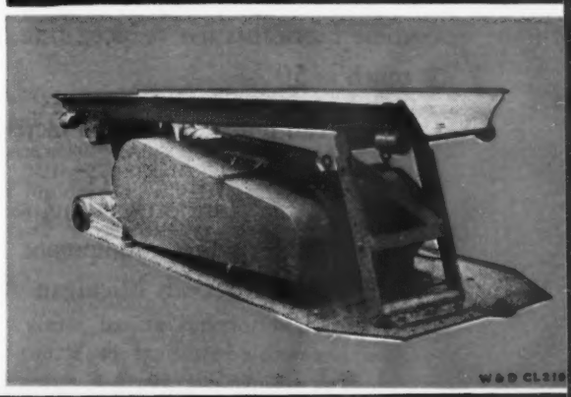
JOY SHAKERS

STAND AWAY OUT IN FRONT



JOY Shaker Conveyors are designed to meet any bend or turn requirements without slowing production.

A JOY Shaker loading into a JOY Elevating Conveyor.



The compact driving section of a JOY Shaker features the exclusive "Cushion Stroke" drive . . . may be placed anywhere along the length of the conveyor.

Rugged · Foolproof Adaptable Better in Every Way–

JOY Shaker Conveyors move coal fast, efficiently, and *more dependably!* Wear and strain on the parts are reduced by the exclusive JOY "Cushion Stroke" drive, resulting in longer service life, fewer parts replacements, and lower operating and maintenance costs. ● There's a combination of JOY Shakers and Conveyor Sections to handle any room and entry conditions—*write for Bulletin.*

Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

...help him load out greater tonnage

No longer do machine operators have to fight balky controls. No longer need tonnage suffer because of inefficient loader operation. Superla Mine Lubricants make possible faster and easier loading, these two ways:

Eliminate warm-up time. Superla Mine Lubricants are fluid at low temperatures. When the machine starts, controls operate freely, eliminating drag. Loading operation can be started immediately.

Prevent erratic operation. Superla Mine Lubricants keep clutch plates clean and permit smooth operation of controls. This allows easier handling of the machine, results in faster loading, and reduces operator fatigue.

These benefits brought by Superla Mine Lubricants have helped increase output of all types of loaders in many midwest mines. At the same time, the superior protection provided by these lubricants has reduced transmission maintenance costs as much as 50%.

You can put the means to increased tonnage at the fingertips of your machine operators—use Superla Mine Lubricants. A Standard Oil Lubrication Engineer will help you choose the correct grades for your equipment. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY (INDIANA)

Superla Mine Lubricants

SIX grades for lubricating any type of cutter or loader

No. 00. An oxidation-inhibited oil containing a detergent additive. It provides exceptionally clean operation and low oil consumption for oil-lubricated gear cases.

No. 0. A high-quality additive-type oil similar to No. 00 but of a slightly heavier grade. It is designed for Goodman loaders and cutters.

No. 2. A soft, semi-fluid grease for lubricating gathering-head gear cases where greater fluidity is desired than that usually provided by most loader greases.

No. 4. A semi-smooth grease particularly resistant to thinning out under heat and mechanical working. At the same time it can easily be poured from the barrel bung at ordinary mine temperatures. It is especially designed for Joy loaders.

No. 6. A grease of heavy consistency and good high-temperature characteristics. Its fibrous structure makes it particularly useful on mine car wheels and for general underground lubrication.

No. 8. A smooth grease having superior high-temperature characteristics. It is suitable for armature bearings and pressure-gun work where a grease of heavy consistency is desired.

NA) STANDARD OIL COMPANY (INDIANA)

STANDARD

This story starts in the ground...

1. It begins here—

There's no place for weaklings in the enormous task of supplying the world with coal.

Trucks have to be tough to stand up under the grueling punishment of such work. That's why you find so many rugged International Trucks working right at the mines. From engines to axles they're engineered for the job.

2. It concerns a baby—

A cute little tyke squalling for warmth! His parents are concerned with that demand—and they're *customers!*

So when they want delivery of coal that spells comfort for him . . . they want it *pronto!* Keeping costs down on such jobs is one place International can help you. For 41 years we've been helping lots of people cut delivery costs.

3. A hospital—

Scene of emergencies—where coal-powered auxiliary electric systems may light critical heart beats.

Coal must arrive here on a dependable schedule. You can maintain that kind of schedule when you drive International Trucks kept at peak operating efficiency by International's specialized service set-up.

5. And trucks like this, which help keep the story moving—

More than 10,000 International Trucks—from small pickups to heavy off-highway units—work for the coal industry. They're engineered, built and serviced to meet every demand of this work.

There are 22 basic International Trucks. There are different engines (gasoline, diesel and butane), wheelbases, axles, transmissions, and other components for efficient specialization-of-truck-to-job. Gross weight ratings range from 4,400 to 90,000 pounds.

In short, there's an International Truck . . . a real "Standard of the highway" . . . to handle *your* hauling jobs the way you want 'em handled. For details, see your International Dealer or Branch.

4. And Mrs. Jones' new refrigerator—

She can't be expected to think of coal-power that helped give her her refrigerator.

But *you* know a lot of coal was hauled to make that refrigerator. You know much of it was hauled in International Trucks. And you know the fleet owners who hauled it wouldn't use trucks that didn't pay off for truck operators.

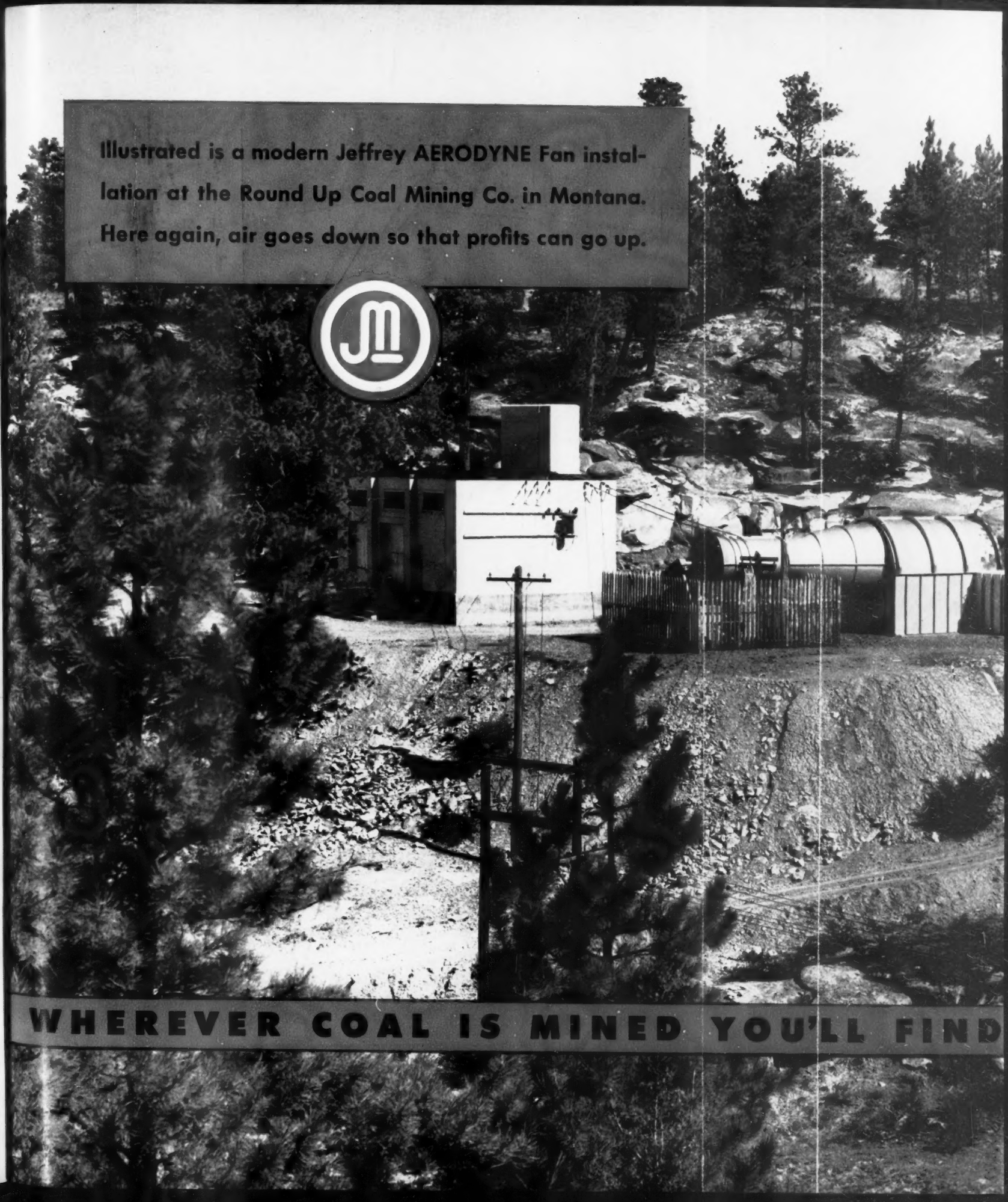
Other International Harvester Products
Farmall Tractors and Machines
Industrial Power . . . Refrigeration

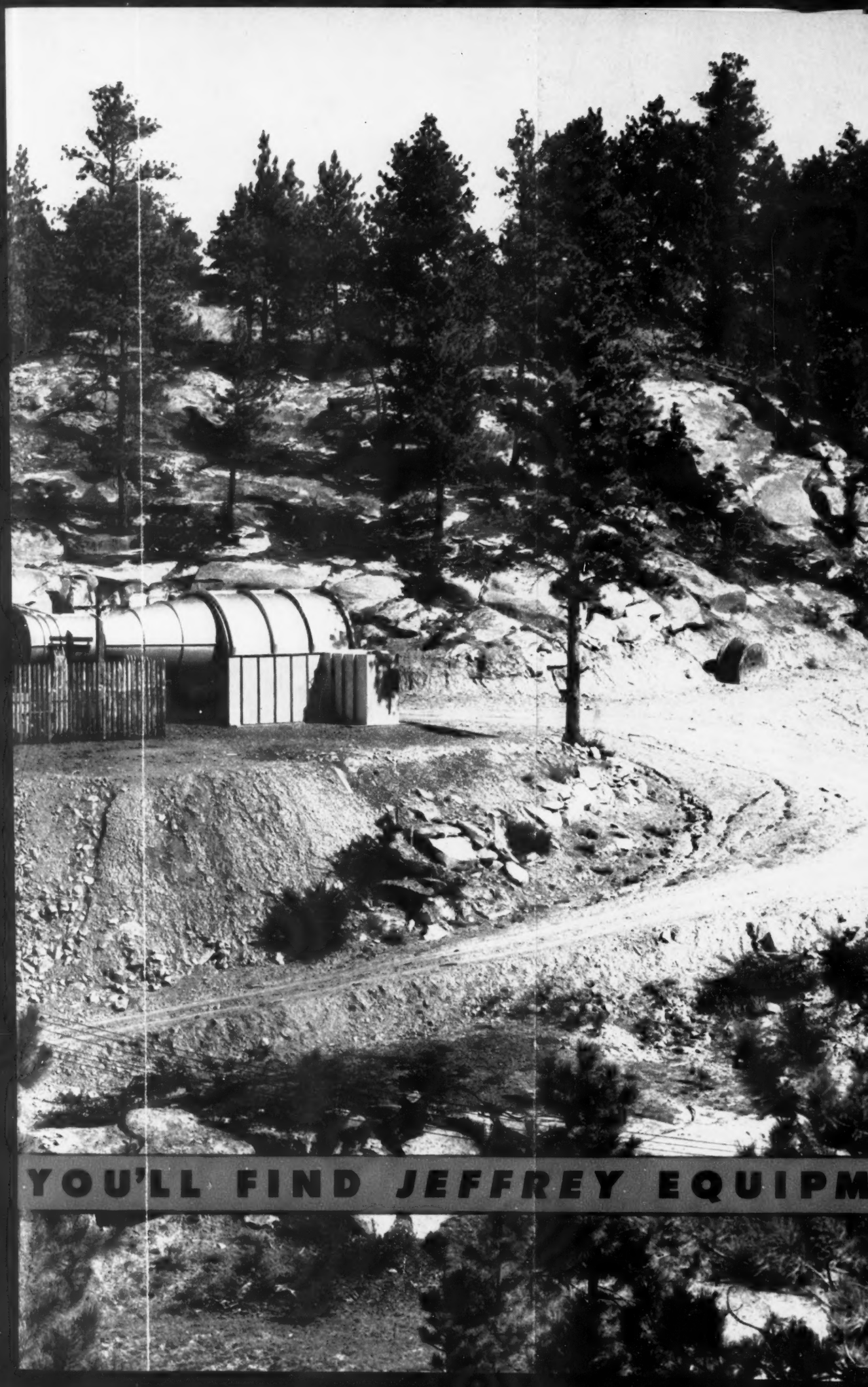
Tune in James Melton and "Harvest of Stars," CBS, Wednesday evenings

INTERNATIONAL

INTERNATIONAL TRUCKS

MOTOR TRUCK DIVISION • INTERNATIONAL HARVESTER COMPANY • CHICAGO


Illustrated is a modern Jeffrey AERODYNE Fan installation at the Round Up Coal Mining Co. in Montana. Here again, air goes down so that profits can go up.
WHEREVER COAL IS MINED YOU'LL FIND


YOU'LL FIND JEFFREY EQUIPM

IPMENT

J
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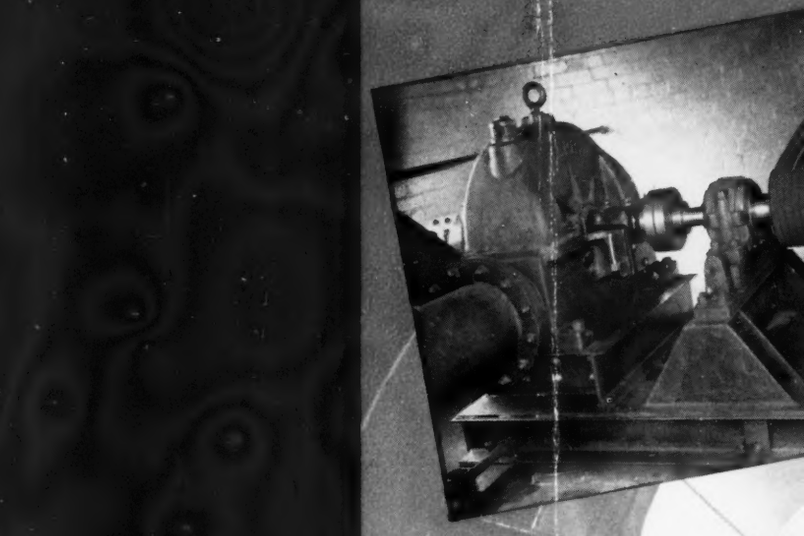

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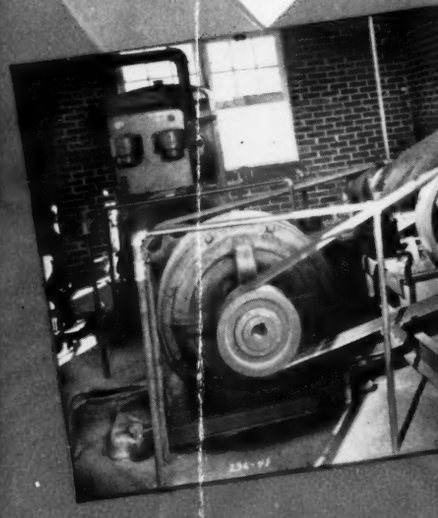
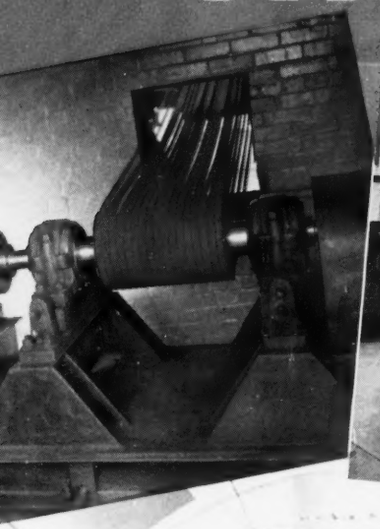
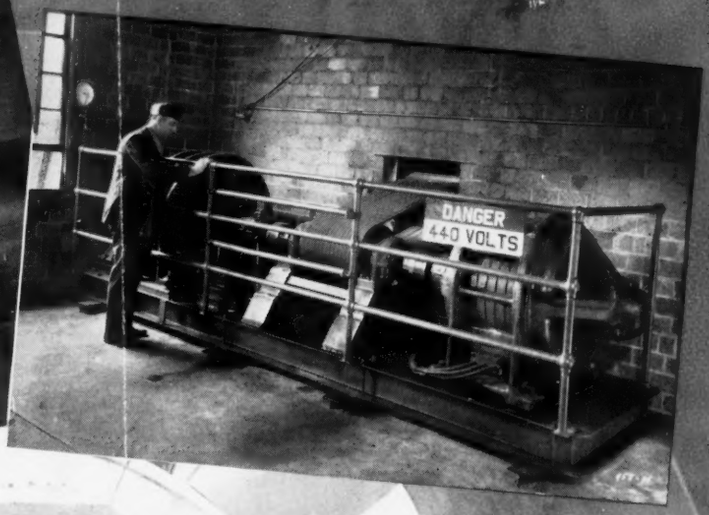
Fresh air underg
know it . . . so d
see that our fans
air *at all times.*
of drive set-ups
running. No dow
it is needed most
an auxiliary pow

Jeffrey engineers
equipment . .
safety. Call upo



JEFFREY AERODYNE FANS

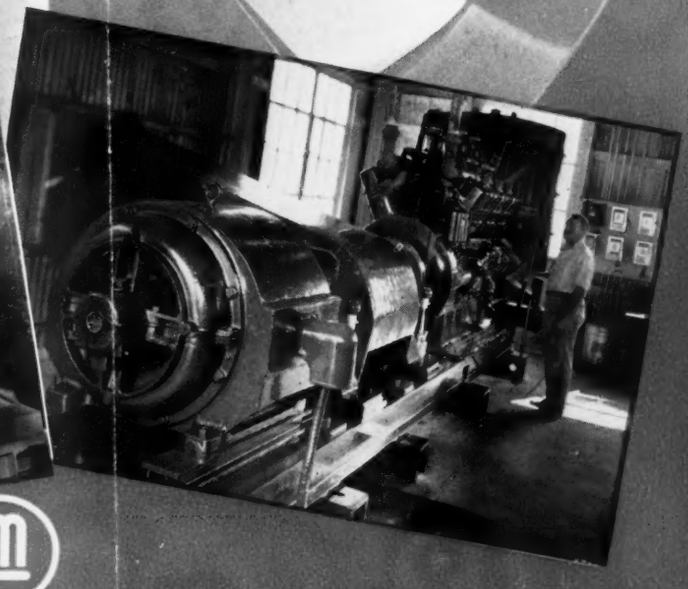




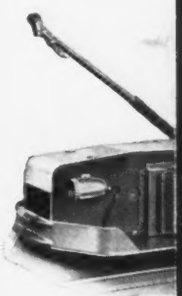
WE TAKE NO CHANCES

r underground is important. The men working down under
. . . so do Jeffrey engineers who make it their business to
our fans are equipped to provide an abundance of fresh
ll times. On this page you see some different combinations
set-ups . . . all with one purpose . . . to keep that Fan
g. No down time . . . no lack of fresh air when and where
ded most . . . no chances are taken when a Jeffrey Fan with
liary power unit is on the job.

engineers will be glad to suggest the proper ventilation
ent . . . the best auxiliary power unit for additional
Call upon them.



LOADING



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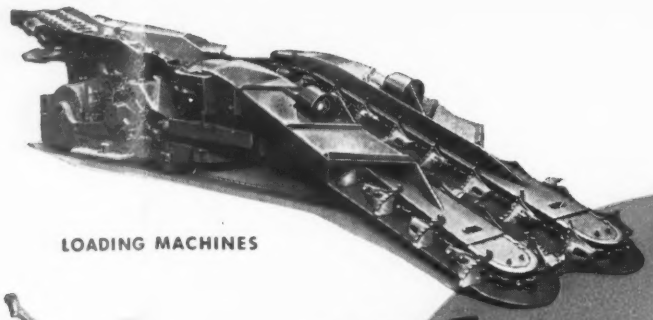
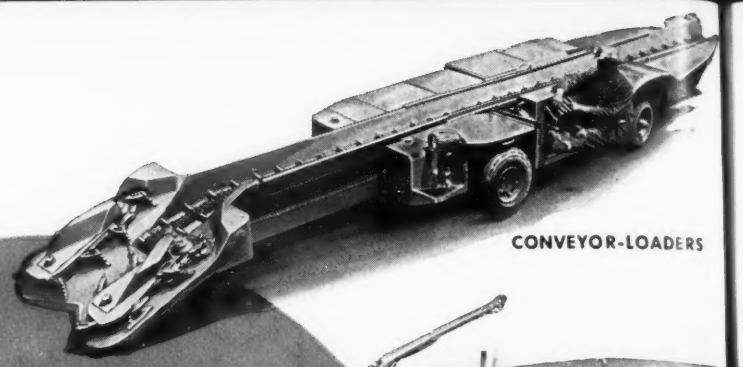
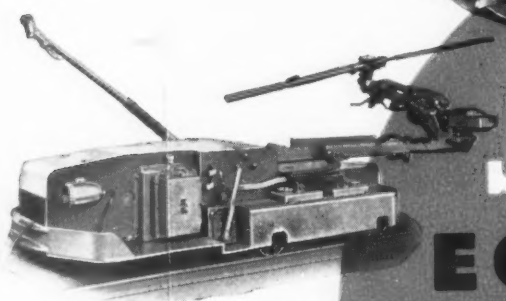


LOADING MACHINES

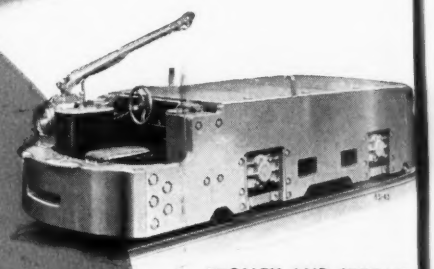


CONVEYOR-LOADERS

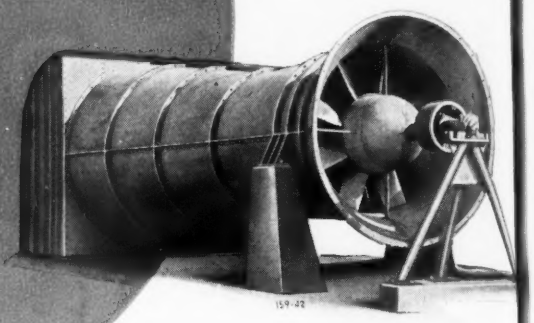


DRILLS AND
DRILLING MACHINES

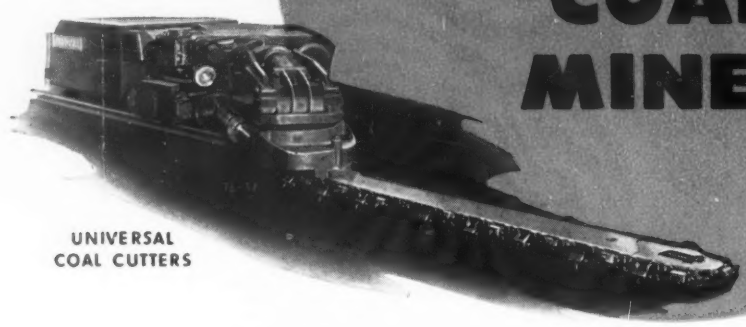
JEFFREY EQUIPMENT FOR COAL MINES



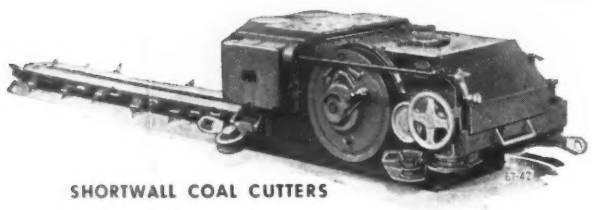
TROLLEY AND STORAGE
BATTERY LOCOMOTIVES



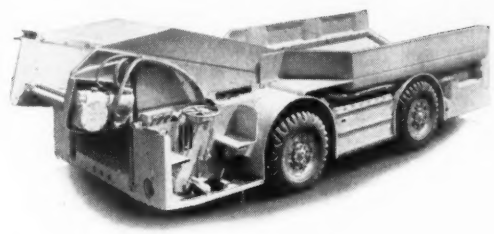
FANS AND BLOWERS



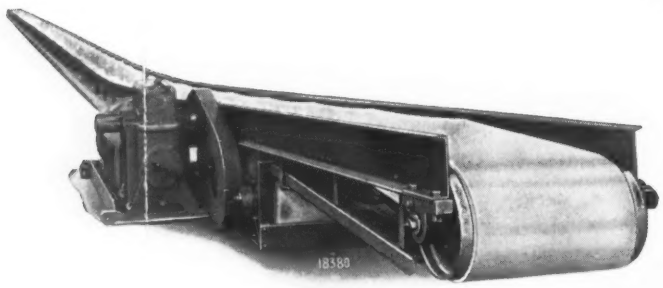
UNIVERSAL
COAL CUTTERS

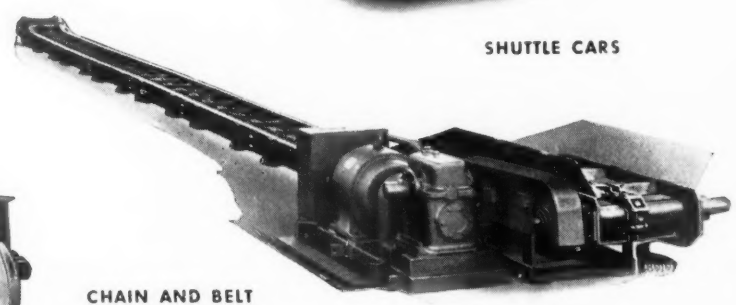


SHORTWALL COAL CUTTERS



SHUTTLE CARS





CHAIN AND BELT
TYPE CONVEYORS

AND GENUINE RENEWAL PARTS

THE JEFFREY MANUFACTURING COMPANY

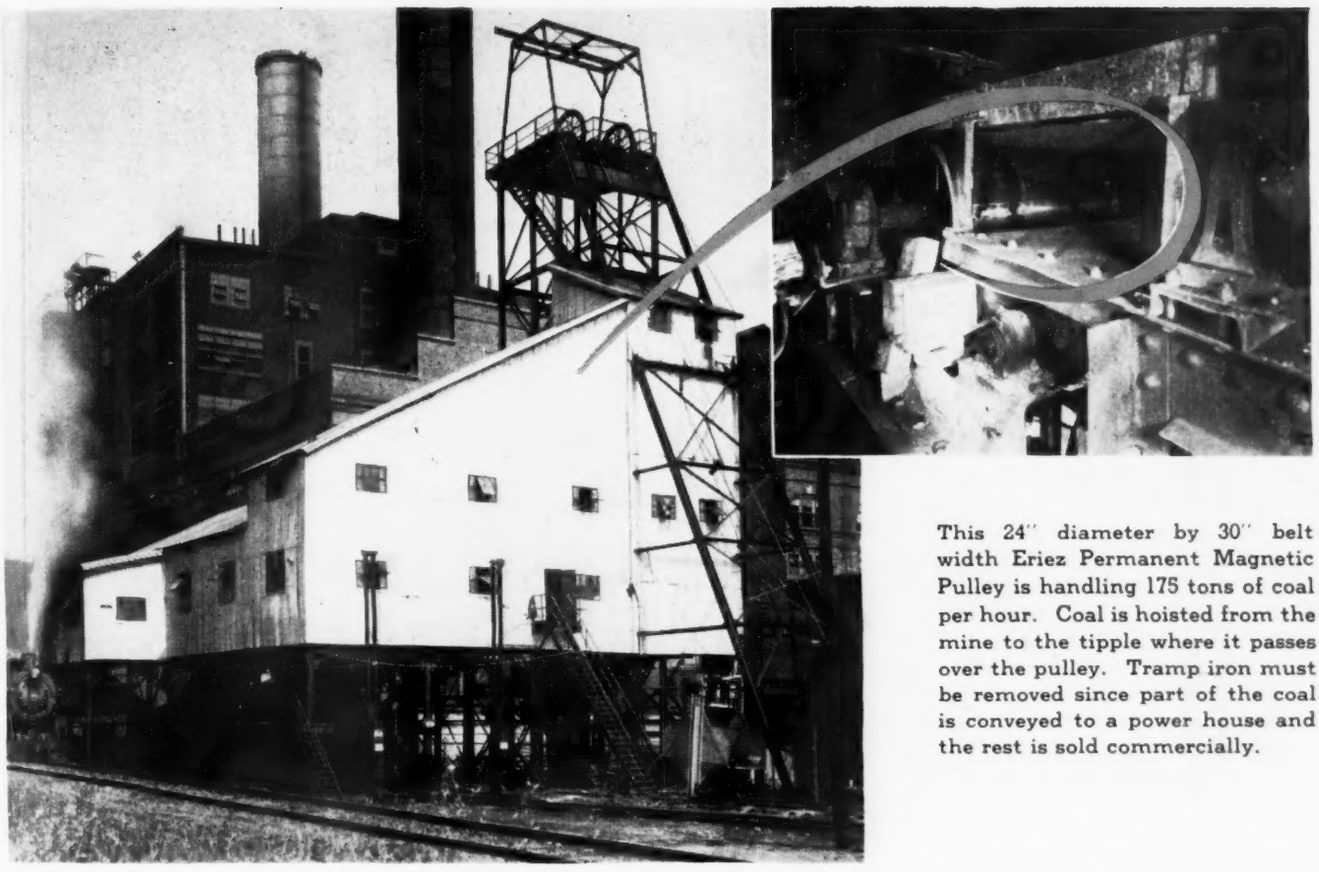
Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Jacksonville, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, Mt. Vernon, Ill., Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.



This 24" diameter by 30" belt width Eriez Permanent Magnetic Pulley is handling 175 tons of coal per hour. Coal is hoisted from the mine to the tipple where it passes over the pulley. Tramp iron must be removed since part of the coal is conveyed to a power house and the rest is sold commercially.

Says the Preparation Engineer:- "Eriez NON-ELECTRIC PULLEYS Give Better Protection Than Ever Before"

"SINCE switching to an Eriez Non-Electric Permanent Magnetic Pulley, we have received better magnetic protection than ever before—as well as reduced operating, repair and maintenance costs. Because of its steady and economical operation, it has been recommended for use in our other mines."

This is a typical report received from a large mine in northern West Virginia, on the newest and most modern method of magnetic separation with Eriez Permanent Magnets. Your first cost is last cost since Eriez magnets are completely self-sustaining and the magnetic strength will last indefinitely. No electric current is needed . . . no maintenance . . . slip rings, coils, rectifiers and other electrical accessories are eliminated . . .

If you have a magnetic separation problem—it will pay you to investigate the complete line of Eriez Permanent Non-Electric Magnetic Separators. Call in an Eriez engineer today and ask him to explain the many advantages of the Eriez method of magnetic separation. Write, wire or phone Eriez Manufacturing Co., 60 East 12th St., Erie, Pa., U. S. A. Representatives in all major cities.

CLIP AND MAIL TODAY
Please send bulletin No. 102B CA-12

We would like to know more about installation of ERIEZ on:
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● *When It's Magnetic Protection . . . See Eriez First*

ERIEZ MANUFACTURING COMPANY

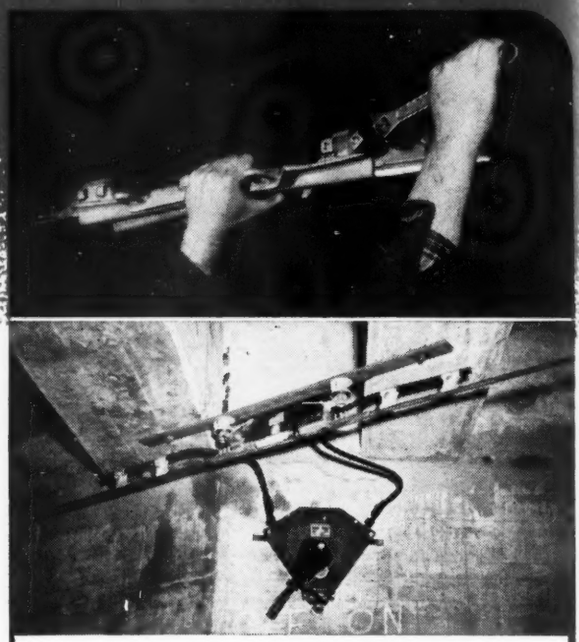
60 East 12th Street, Erie, Penna.

FOLLOW THIS FORMULA

GOOD MATERIALS . . .

Good trolley haulage performance starts with the materials from which the overhead system is constructed. It pays to use only the best devices available—materials which have been proved successful on the job.

Select the proper materials to use from the complete line of O-B Trolley Overhead Fittings. Shown above are a few of the more popular items. Others may be found in your No. 22 Catalog. All are designed and built with ample strengths to afford maximum service life.



GOOD INSTALLATION . . .

Good materials work best when they are installed correctly. Reasonable care should be exercised to obtain tight connections and proper alignment between fittings and trolley wire. The workman pictured in the top photo is installing a smooth underrun Bulldog Tip in a Type-M Trolley Frog.

The lower photo shows a sectionalizing installation that is up to stay for years of trouble-free service. Materials used are a Safety Feeder Switch and a Metal Underrun Section Insulator.

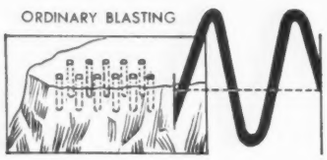
Why not apply this formula to your mine by enlisting the aid of the O-B organization? Our engineers will be glad to recommend the right O-B overhead materials to meet your individual requirements; they will suggest proper installation and maintenance procedures. Make O-B your headquarters for trolley overhead service.

No Wonder They Call It "Ripple" Blasting!

ROCKMASTER

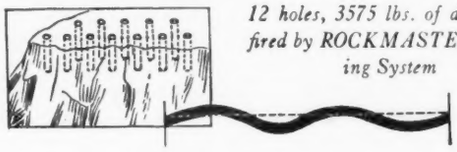
Smooths Waves Into Ripples

ORDINARY BLASTING



11 holes, 3300 lbs. of dynamite fired by ordinary methods

ROCKMASTER BLASTING



12 holes, 3575 lbs. of dynamite fired by ROCKMASTER Blasting System

As the Seismograph Will Show

An independent research engineer has invented his own nickname for the ROCKMASTER system of blasting: he calls it "Ripple" Blasting. Hundreds of enthusiastic ROCKMASTER users—miners, quarry and construction men the country over—will be quick to agree that it is an apt name.

Watch a ROCKMASTER quarry type blast and you will see how the face "ripples" before falling directly where the blaster has indicated he wants it.

Listen to a ROCKMASTER blast and you will hear how vibration has been cut down to "ripples" instead of objectionable waves of noise and vibration that stir up complaints in the neighborhood.

No Special Equipment Needed

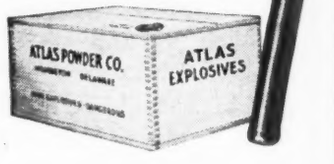
ROCKMASTER results are accomplished through proper choice and loading of explosives and the use of ROCKMASTER electric detonators. The blast is split up into smaller blasts staggered milliseconds apart. No special equipment is needed. It's the effective use of "timing" that produces these money-saving results:

1. *More rock ready for the shovel.*
2. *Better fragmentation*—less secondary blasting.
3. *Far less "back-break"* in quarries. Less pulverizing of coal in strip pits.
4. *Wider spacing of drill holes* can frequently be used, saving drilling costs and explosives costs.
5. *Better control of "throw."*

Call in the Atlas representative today. He will be glad to give you the benefit of Atlas pioneering in millisecond delay blasting.

ROCKMASTER GIVES YOU THE GREATER SAFETY OF MANASITE DETONATORS

Less Bark... More Bite



"ROCKMASTER"—Trade Mark
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ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

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aids teamwork underground

The smooth operation of each group of workers underground is aided strongly by Edison Electric Cap Lamps. Brilliant, *unfailing* light, powered by the unique Edison nickel-iron-alkaline battery, enables each miner to do his work better—and more safely—at all times. May we arrange a practical demonstration for you?

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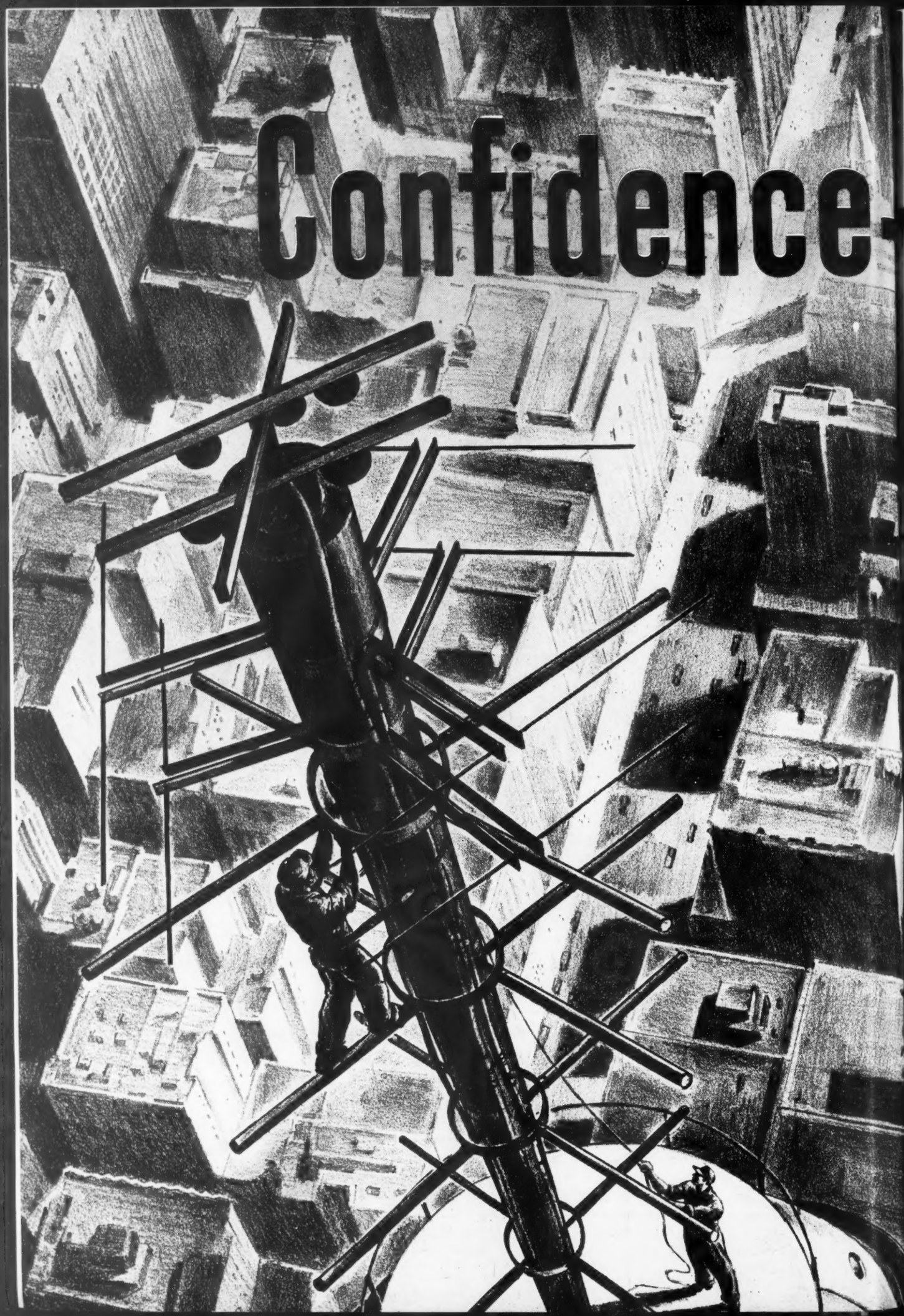

Confidence

WITH ITS SLEEVES ROLLED UP!

ATOP THE WORLD'S TALLEST BUILDING . . . yet not high enough! Television's need for unobstructed, long-range broadcasts may be met by planes in the stratosphere, relaying signals from the earth. Engineers working on this problem are confident of ultimate success.

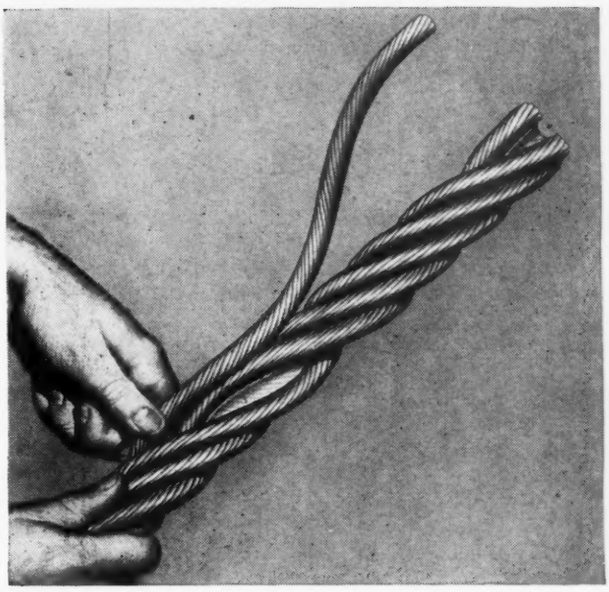
With like confidence, Roebling blazes new trails in developing and making products vital to communication and all other industries. And the widespread confidence today reposed in Roebling is our most guarded asset. Leadership is maintained only by constant progress . . . our ideal is to make Roebling products and engineering service the best obtainable anywhere, *any* time.

WHEN TO SPECIFY ROEBLING *Preformed* WIRE ROPE

WHEN IT WILL SAVE YOU MONEY is the time to specify Roebling Preformed Wire Rope. Wherever wire rope is subjected to severe bending, Roebling Preformed is an outstanding money-saver. On thousands of installations it lasts far longer than Non-Preformed ropes . . . pulls down performance costs to an all-time low.

Great resistance to fatigue from bending helps give Roebling Preformed a long life, but you can chalk up other big advantages. Preformed is not inclined to twist and kink . . . is easy to handle and install. It can be cut without seizing. Broken wires lie flat . . . don't injure hands or chew up drums and sheaves.

Get your Roebling Field Man's advice about Roebling Preformed and the possibility of its saving you real money. You can act on his suggestions with full confidence for he *knows* wire rope, how to choose the *right* one, how to install and maintain it for top service. Write or call him at your nearest Roebling branch office.



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ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING

G-E Portable Mercury-Arc Rectifier gives this Colorado mine operator higher working voltage at the face—more efficient mining machinery operation—higher output per shift.

At the Clayton Coal Company's Washington Mine, with a voltage of 190 v at the working face, coal cutter speed used to be 17 inches per minute. A round trip for a loaded car took 12 minutes.

Now, with the working voltage raised to 275 v, coal cutter speed averages 32 inches per minute—*a jump of 88%*. Round trips for the same number of loaded cars take 8 minutes—cutting *one-third off* the former time. Here's how it was done:

Early in 1946, a 200-kw G-E portable sealed-ignitron mercury-arc rectifier was delivered to the mine entrance and moved easily on the haulageway tracks to a position near the cutting face. A-c and d-c connections were made quickly and simply, putting 275 volts of d-c power near the cutting face. This completed the installation.

The G-E rectifier has cut over-all mining cost per ton with these definite improvements:

***MORE EFFICIENT OPERATION*—because voltage at all underground electrical equipment is held to close limits and power continuity is assured even during peak load periods.**

***LOWER LINE LOSSES*—because the d-c power is transmitted over shorter distances to the working area, making ample power available right where it's needed.**

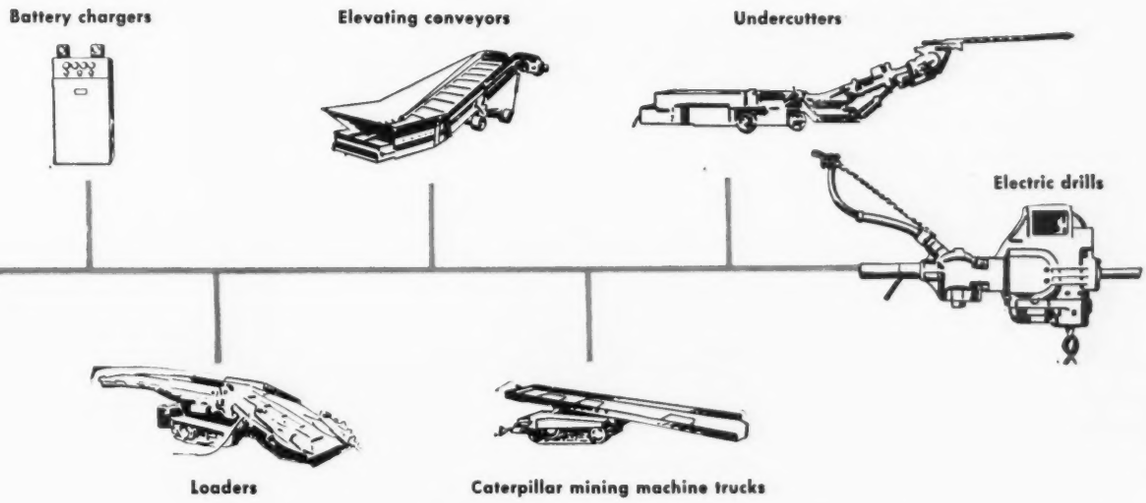
In fact, this mine operator, who is one of the largest in the northern Colorado field, says the rectifier equipment paid for itself in a year with greater production at lower cost.

Have you looked into the cost-reducing possibilities of a G-E mercury-arc rectifier for your underground mining operation? Get the facts now. Call or write our nearest office for Bulletin GEA-4047. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

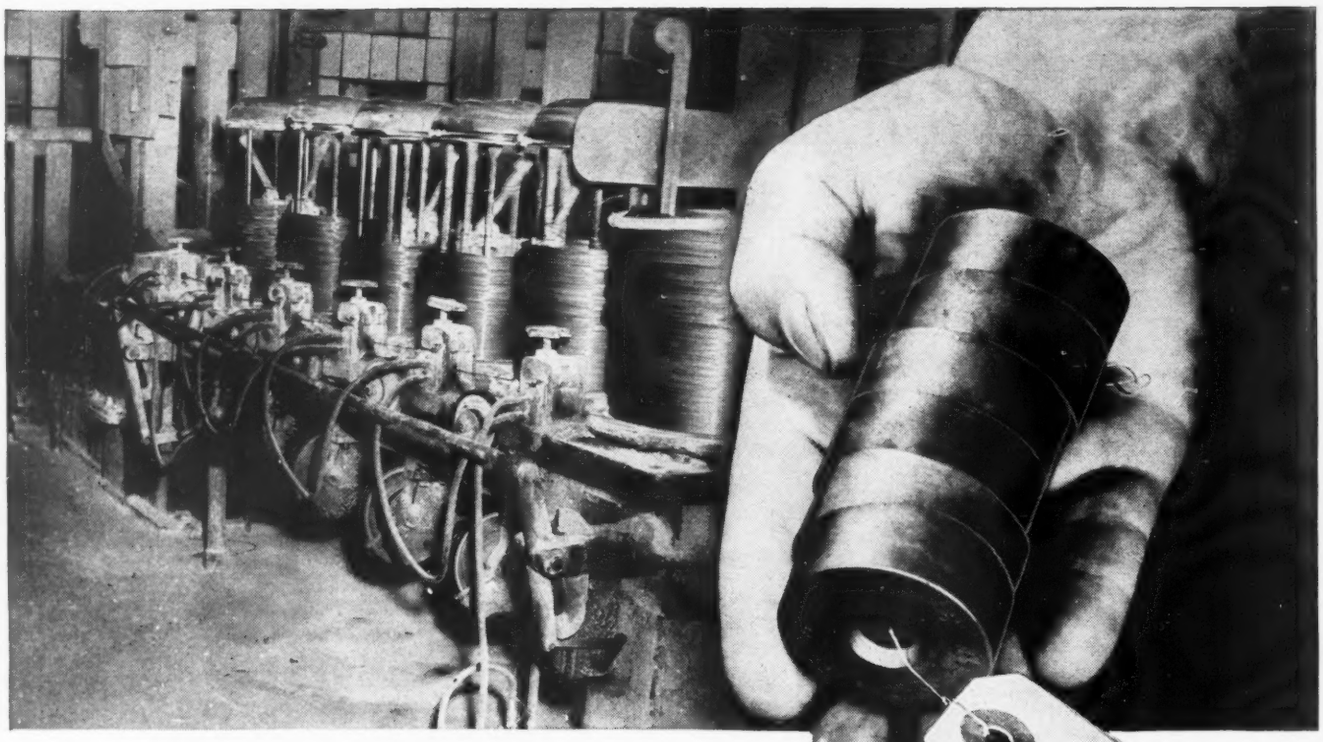
G-E PORTABLE MERCURY-ARC RECTIFIERS provide these worthwhile advantages for underground applications:

1. Enclosed for greater personnel safety
2. Highly portable close to the working face
3. Low-height design for use in thin seams
4. Wide range of available ratings
5. High conversion efficiency in all ratings
6. Low maintenance costs
7. Long, continuous service

Schematic diagram below shows how the G-E portable mercury-arc rectifier substation serves mining machinery in the Washington Mine of the Clayton Coal Company.



GENERAL ELECTRIC



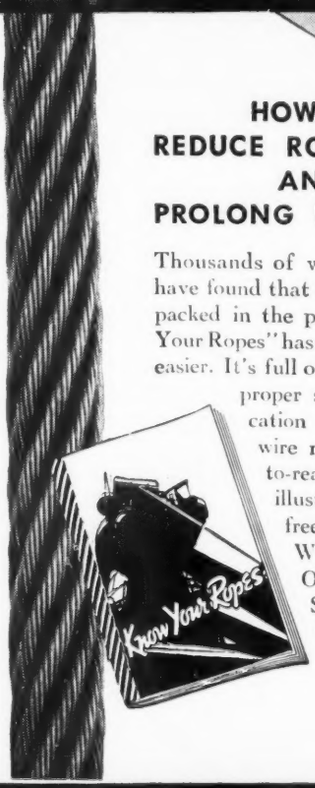
Wickwire's wire drawing dies are accurate within .0003 of an inch.

In Rope Wire too—Reducing Methods Must be Safe

Making rope wire slim and strong is as scientific as any reducing method for humans—and a lot more certain of correct results. At the Wickwire plant, the size and sequence of wire drawing dies are carefully calibrated to provide for uniform reduction and to avoid the possibility of wire becoming brittle. Skipping of drafts, another cause of wire embrittlement, is eliminated by use of continuous wire drawing machines which will not function unless all dies are in their proper place.

Drawing, cleaning, heat treatment—every step necessary to reduce Wickwire Rope Wire to final size is closely supervised. The finished wire is accurate within a fraction of a thousandth of an inch. Production of strands and finished ropes is equally exacting.

All this adds up to Wickwire Rope being the logical choice of rope users who demand the utmost in performance, safety and long life. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed. Wickwire Distributors and Rope Engineers are always ready to help solve your wire rope problems and supply the right rope for your needs.



HOW TO REDUCE ROPE COSTS AND PROLONG ROPE LIFE

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write—Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.

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A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

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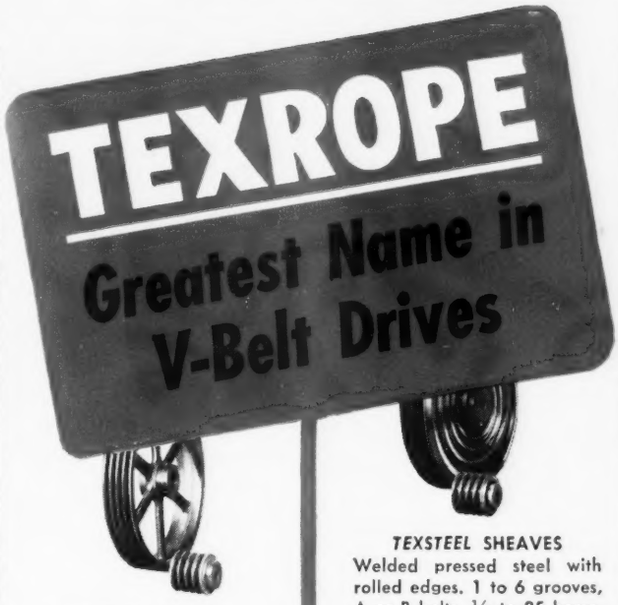
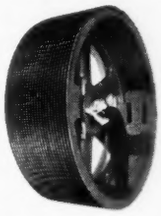


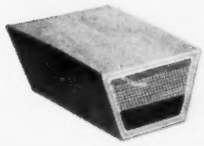
***TEXDRIVE* SHEAVES**
Cast Iron with 1 to 6 grooves for A and B belts. 1 to 25 h. p. *All sizes from stock.*

VARI-PITCH WIDE RANGE SHEAVES
Speed range up to 100%. 1 to 4 grooves, Q and R belts, fractional to 30 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*

***TEXSTEEL* SHEAVES**
Welded pressed steel with rolled edges. 1 to 6 grooves, A or B belts, ¼ to 25 horsepower. *All sizes from stock.*



STANDARD CAST IRON SHEAVES
Made to order from stock patterns. 1 to 14 grooves, A, B, C, D, or E belts, 1 to 1000 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*



***TEXROPE* SUPER-7 V-BELTS**
Wide range of types, sizes and sections to suit all operating conditions. *All standard sizes from stock.*

***MAGIC-GRIP* SHEAVES**
Semi-steel with patented taper bushing. On and off in a jiffy. 2 to 12 grooves, B, C, or D belts, 2 to 250 horsepower. *All sizes from stock.*

SPECIAL CAST IRON AND STEEL SHEAVES
Any number of grooves for A, B, C, D, or E belts. Up to 6000 horsepower. Delivery good. *Call your nearest District Office or Texrope dealer.*

***TEX-IRON*, SHEAVES**
Light weight single groove sheave for fractional horsepower applications. *All sizes from stock.*

***VARI-PITCH* STANDARD SHEAVES**
Speed range 9% to 28%. 2 to 10 grooves, A, B, C, D, or E belts, 1 to 300 horsepower. Stationary or Motion Control. Delivery good. *Call your nearest District Office or Texrope dealer.*

***VARI-PITCH* SPEED CHANGERS**
Speed range to 375%. 1½ to 75 horsepower. Single handwheel controls speed. Delivery good. *Call your nearest District Office or Texrope dealer.*

Best Delivery in the Industry!

NOW *YOU CAN GET* nearly every standard V-belt drive component from Texrope stocks. Even on non-stock items, Texrope delivery is the best in the industry. And Texrope is the *only* brand that meets *every* V-belt need.

Selecting a drive is as easy as looking up a telephone number in the 144 page Texrope Pre-Engineered Drive book. Covers 90% of all V-belt drives. Write today for Bulletin 20 B 6956 or see your nearest Allis-Chalmers Authorized Dealer or District Office. Also listed in Sweet's.

ALLIS-CHALMERS, 968A SO. 70 ST. A 2546
MILWAUKEE, WIS.

Texrope, Super-7, Vari-Pitch, Magic-Grip, Tex-Iron, Tex-steel and Texdrive are Allis-Chalmers Trademarks.

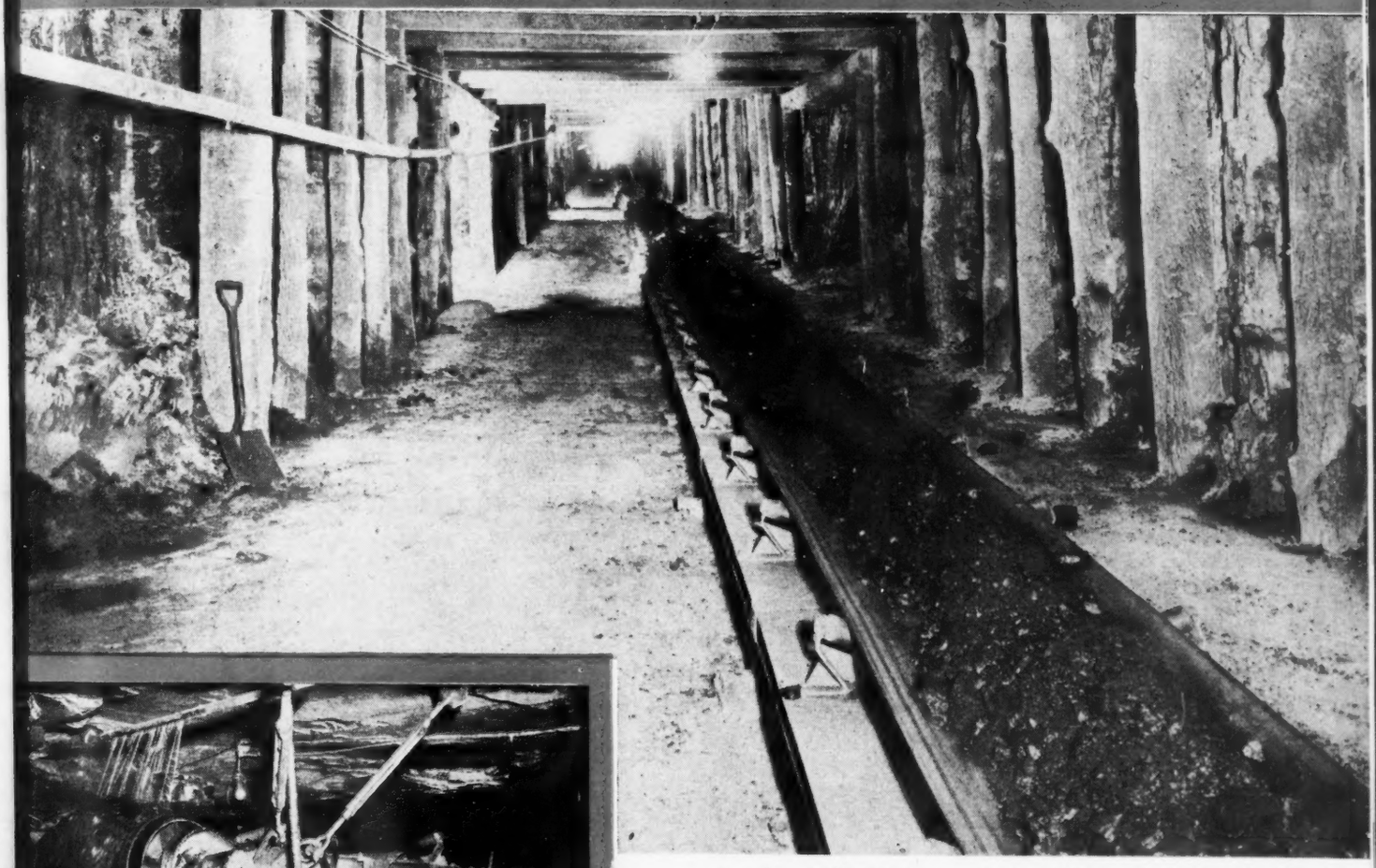
Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

ALLIS-CHALMERS

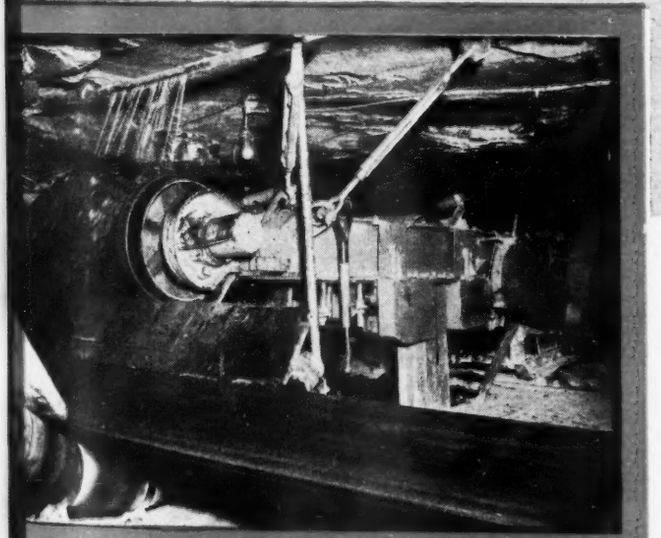
Originators of the Multiple V-belt Drive for Industry

JOY BELT CONVEYORS

YOUR BEST BET IN THE LONG HAUL!



A modern JOY Belt Conveyor is the efficient main haulage in this mine.



ransfer point between JOY gathering and "mother" conveyors.

★ Designed for LOW MAINTENANCE

★ Built for LONG LIFE

★ Proved for RELIABILITY

For gathering or main haulage systems, you'll find JOY Belt Conveyors most efficient in providing a smooth, continuous flow of coal at minimum cost, and with greatest dependability. Rugged construction and sealed-for-life idler bearings, requiring no lubrication, assure trouble-free operation with low power consumption and the least possible maintenance cost or shut-down time. • JOY builds a conveyor—belt, chain or shaker—for *every* mining condition. *Write for Bulletins,* or for engineering assistance.

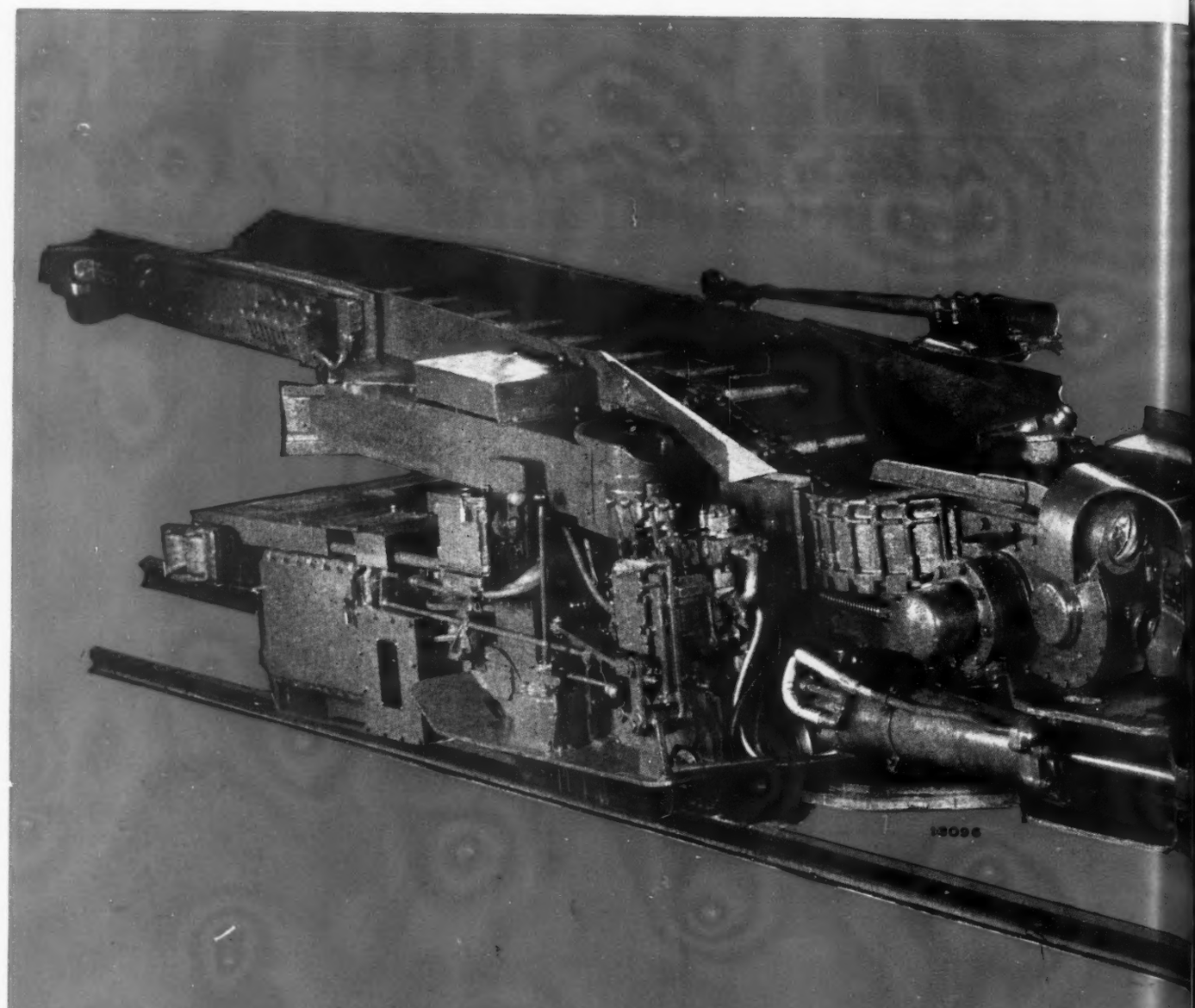
Consult a Joy Engineer

W&D CL

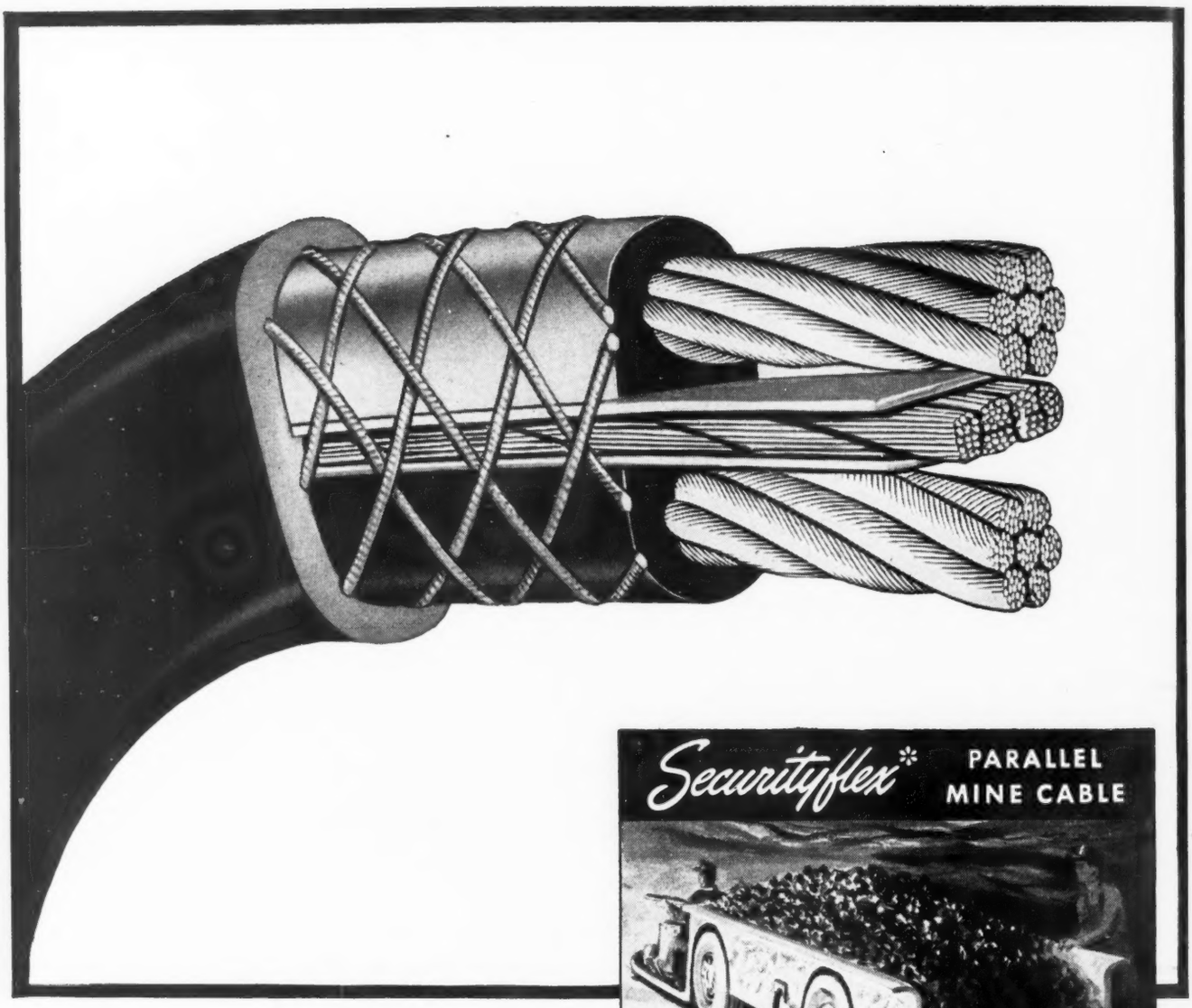
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



CAPACITY • SPEED • POWER



BUILT TO DELIVER
MORE TONS PER CABLE

"SECURITYFLEX" has grown to mean *leadership* in mine cable as a result of . . .

Anti-short breaker strip between conductors (available in cable with or without grounding wire) . . . crush resistance . . . special heat resistant insulation . . . rugged neoprene jacket that resists flame and abrasion . . . non-kinking construction . . . assurance of more continuous service. All this means *more tons per cable.*

Securityflex meets all requirements of the U. S. Bureau of Mines Flame Test and diameter specifications. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

NEW DESIGN GIVES LONGER SHUTTLE CAR SERVICE

Shuttle car service demands a cable that can take it. The inherent advantages of Securityflex Parallel Mine Cable, coupled with a recent improvement in design that greatly reduces grounding wire failures, make this cable more suitable than ever for shuttle car use. You will find this parallel mine cable gives longer, safer operation under the extreme cable tensions encountered in shuttle car service.

4567G

ANACONDA *Securityflex** **MINE CABLE**

ANACONDA from mine to consumer

*An Anaconda Trade-Mark

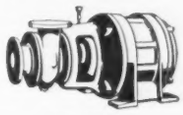
Is THIS the pump you need?

IT'S COMPACT Pump and motor are combined in one rigid cast iron frame. Fits easily into close quarters—is quickly installed as a "package," and operates in any position—no shafts to align. Just bolt it down, make power and pipe connections, and start pumping. Capacities 15 to 1400 gpm, heads to 500 ft.

IT'S EFFICIENT Drip-proof motor is of Allis-Chalmers Lo-Maintenance design, specially built for pumping service. Pump has such long-service features as bronze wearing rings, new plastic water seal, five or more rings of packing, and first class construction throughout. Every unit is factory tested for efficiency, capacity and head.

IT'S AVAILABLE Many sizes of the Electrifugal and other smaller Allis-Chalmers pumps are now in stock for immediate delivery. Perhaps the size you need is ready. Phone or wire your nearest Allis-Chalmers office or dealer for up-to-the-minute information on availabilities and deliveries. For information on the complete A-C line of centrifugal pumps, ask for Bulletin B6059D. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN. A 2381

PEDRIFUGAL
The new A-C pump for flexible Texrope V-belt drive. Capacities to 500 gpm, heads to 100 ft.



SS UNIT
Close-coupled pump and motor units, made in 234 standard ratings, to 2500 gpm.

Electrifugal, Pedrifugal, SS Unit and Texrope are Allis-Chalmers Trademarks.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

MIGHTY PREPARATION

that respond to *Finger-Tip*

● Just the touch of a finger on an electric button and these great preparation plants start the transformation of coal into a premium-priced product.

Hour after hour, they separate coal from its impurities with great accuracy, screen, dry, and load it for delivery . . . all in one continuous automatic operation.

Ash is controlled to a fixed percentage regardless of variations in feed. Fine inherent qualities of raw coal are improved.

From Alaska to South America, wherever bituminous coal is mined, you will find McNally plants in operation . . . responding to finger-tip controls to turn coal into a clean, uniform product capable of top performance and meeting sales-department requirements.

We invite your inquiries about modern preparation plants and the scientific processing of coal the automatic, McNally Pittsburg way.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

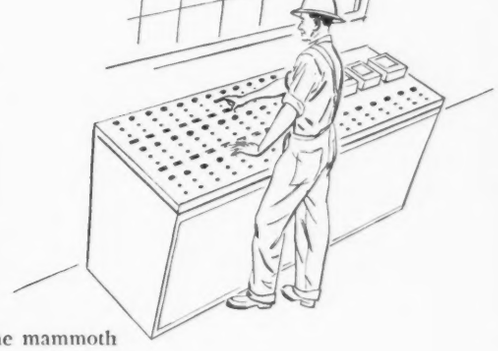
McNally Pittsburg Manufacturing Corporation — *Manufacturing Plants:* Pittsburg, Kansas • Wellston, Ohio
Engineering & Sales Offices: Pittsburg, Kan. • Chicago (1), Ill. • Pittsburgh (22), Penna.
Wellston, Ohio • Caixa Postal 1310, Rio de Janeiro, Brazil

• The Homestead Preparation Plant at St. Charles, Ky. Designed, erected, and equipped by McNally Pittsburg.

PLANTS

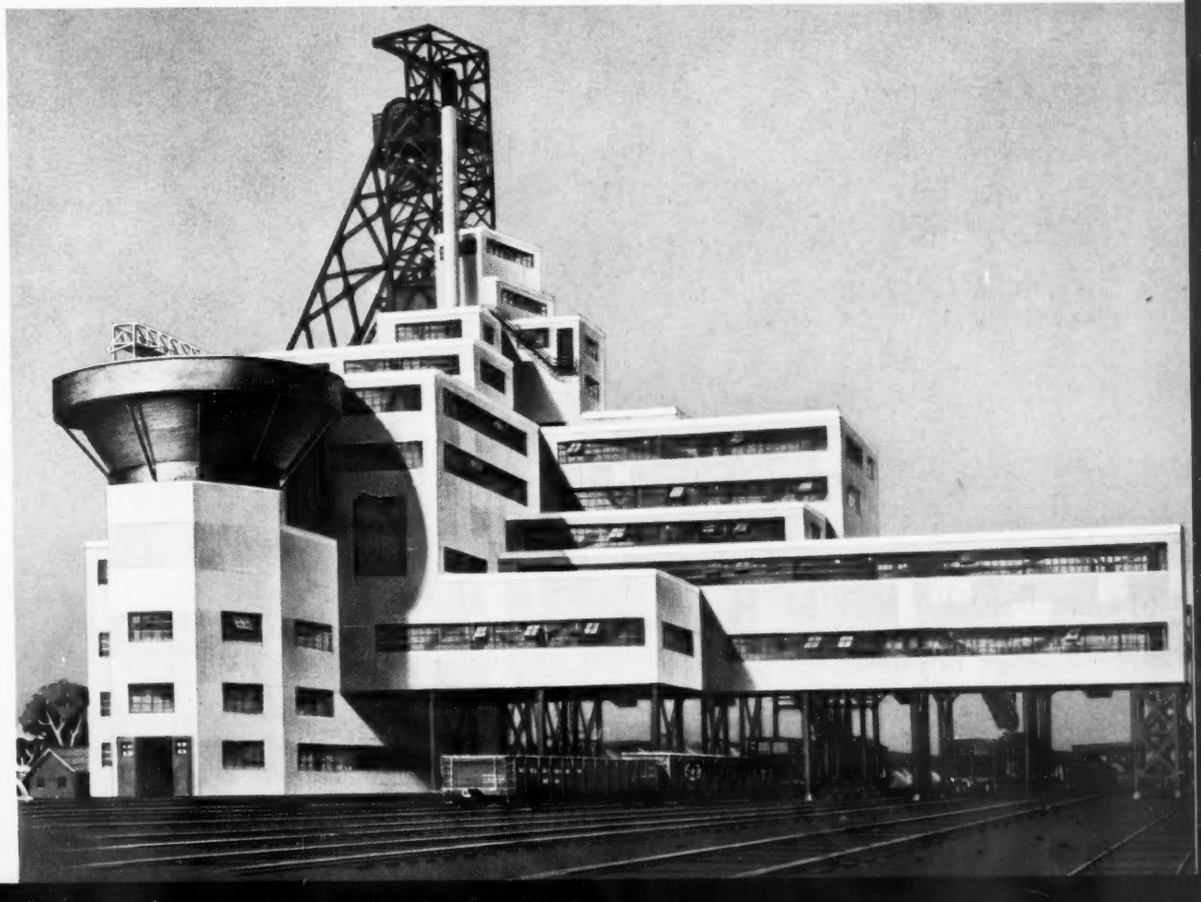
Controls

• Finger-tip controlled plant of Caney Creek Mining Co., Inc., Caney Creek, Ky.



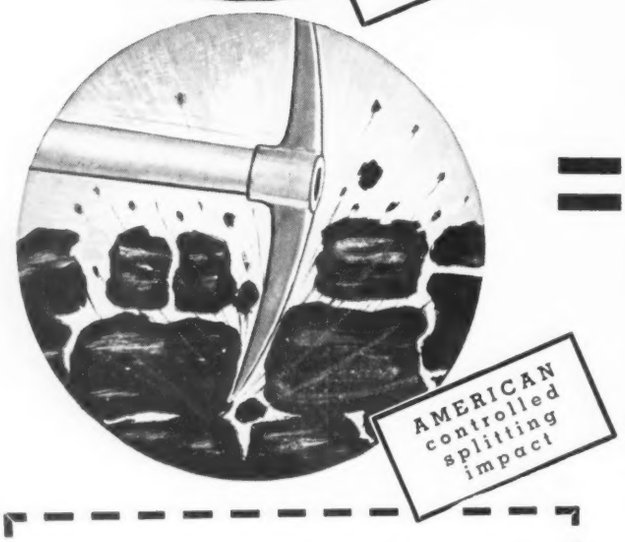
• The mammoth Truax-Traer Plant, Shamrock Mine No. 1, at Kayford, West Va.

• New preparation plant of the Snow Hill Coal Corporation, Terre Haute, Indiana.



PREPARATION vs. PROFITS
answered . . . the AMERICAN way

= UNCONTROLLED SIZING
EXCESS FINES
COARSE SIZING



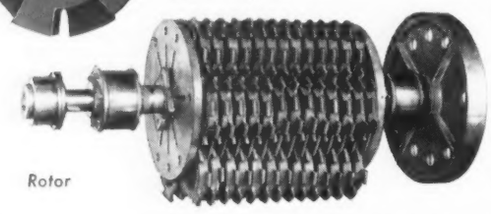
= MORE MARKETABLE
and PROFITABLE
CONTROLLED SIZING

Your profit is in the preparation — and American Crushers are designed especially to help you get higher tonnage — greater profits, with lower preparation costs. By reducing coal through cleavage instead of blunt shattering force, Americans give a controlled ratio of fines — no oversize — and permit a high tonnage output of uniform marketable sizes — regardless of the range of reduction.

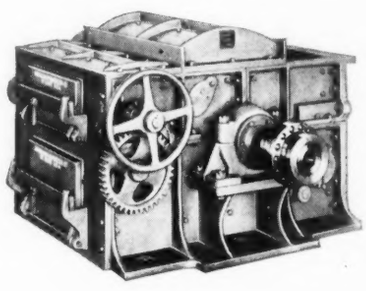
Doubly adjustable for flexibility of sizing to meet fluctuating market conditions, Americans give added savings by operating at low, power-saving speeds. Available in a wide choice of types and sizes to exactly fit your operation . . . capacities from 50 to 500 TPH.

Shown here are American's exclusive manganese steel shredder ring and rotor assembly — for rapid reduction action at slow, power-saving speeds. Each ring has twenty cutting edges — and revolves on individual shaft, free to deflect from tramp iron without damage.

Shredder Ring



Rotor



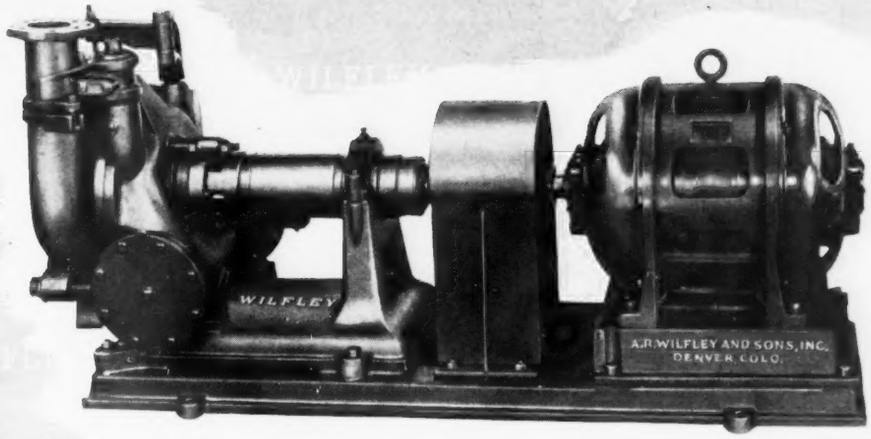
American AC Type Rolling Ring Crusher, with housing of massive, high-test cast construction, rib-reinforced to withstand enormous crushing strains. Dust-tight, machined joints. All crushing parts of manganese steel.

Send for AC Bulletin on coal crushing data and crusher specifications.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Avenue
St. Louis 10, Mo.



Cost Saving Performance

Individual Engineering on every application—PLUS the exclusive principles of design and construction embodied in every WILFLEY pump—mean dependable, cost-saving high efficiency in handling sands, slimes and slurries. WILFLEY pumps enjoy an enviable reputation, kept up through the years by continuous pioneering, research, development and experience in the field. Heavy pumping parts of rubber, alloy iron, alloy steel—whatever material best suits your job. This is the pump to buy when you want continuous uninterrupted performance at extremely low cost. Write or wire for complete details.

WILFLEY
centrifugal PUMPS

A. R. WILFLEY & SONS, INC., DENVER, COLORADO, U.S.A.
New York Office: 1775 Broadway, New York City

He'll help you avoid crushed rope

IWRC

An independent wire rope core gives added support to the strands which lie around it.

In many types of wire-rope service, heavy pressures on the rope itself are unavoidable. The Bethlehem man knows, for instance, that even with the best of spooling, a fiber-cored wire rope is sometimes crushed on the drum. Often, too, loads are so heavy that great pressures exist as the rope passes around sheaves. These pressures frequently have a distorting effect on the wire structure of the rope.

When such conditions exist, the Bethlehem field engineer can usually spot them. Then he'll generally recommend rope with an IWRC (independent wire rope core). The IWRC is made entirely of steel wires and takes the place of the usual fiber core. Being all-steel, it naturally gives better support to the strands of the rope proper. Thus, to a large extent, heavy outer pressures are counteracted; the chances of crushing or distorting the rope are greatly reduced.

It's a good idea to have the Bethlehem field man look over your equipment, to see whether you need rope with IWRC. He will recommend it only where needed. In many cases, IWRC lowers costs substantially by greatly prolonging rope life.

Any time the Bethlehem man can help you—with this or other wire-rope problems—ask him to pay you a visit. He's always glad to, and there is never any charge for his services, no matter how much time he spends with you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM WIRE ROPE
BETHLEHEM STEEL

When you think WIRE ROPE . . . think BETHLEHEM

Lubricant storage and handling *simplified!*

Gulf Mining Machine Lubricant B

does the job of 2 or 3 other lubricants – *and does it better!*

When you use Gulf Mining Machine Lubricant B you can eliminate from 2 to 3 other lubricants depending on the type of equipment you operate. This means less confusion at the face, elimination of application mistakes, better lubrication.

At the same time Gulf Mining Machine Lubricant B provides better protection for cutting and loading machines: its heavy body means less leakage from gear cases; its superior lubricating value insures less wear; its exceptional adhesiveness prevents throwoff or channeling; and it resists the washing action of water.

Gulf Mining Machine Lubricant B is equally effective for plain and antifriction bearings and for gears in drives and transmissions.

To get the many benefits possible with this quality product, and for expert help in other phases of improved lubrication, call in a Gulf Lubrication Engineer. Write, wire, or phone your nearest Gulf office today.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
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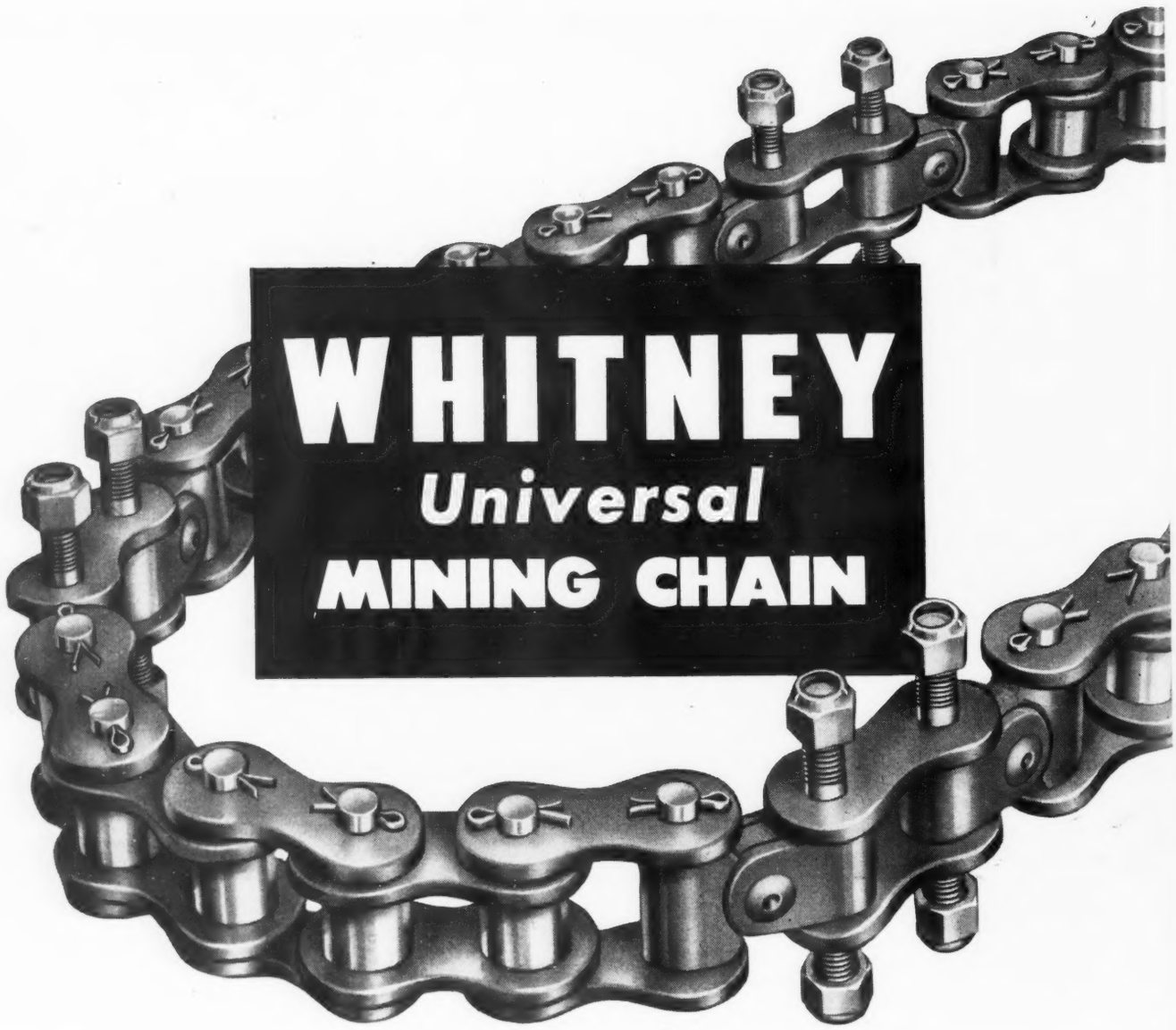
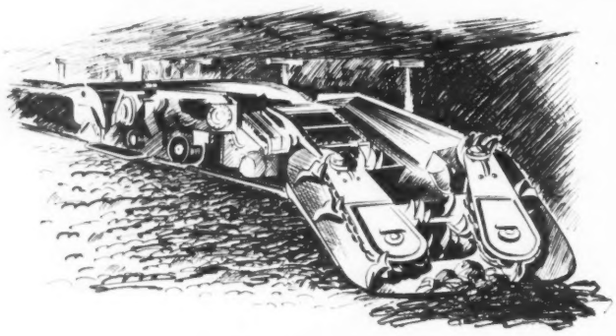
GULF INDUSTRIAL LUBRICATION



will Cut Costs and Boost Tonnage



You can be sure of continuous, up-at-the-face production if your mechanical loaders are equipped with Whitney Universal Mining Chain. This rugged, dependable chain is especially designed to give long, trouble-free service under the severest of mining conditions.

All link parts are made of alloy steel, heat treated for extreme toughness and durability. The universal joints are alloy steel forgings, accurately machined. Flight studs are fully machined with milled threads. End pins are fully riveted into deep countersink in forgings, have maximum anchorage. These features give you the utmost in operating life . . . cut chain maintenance to the bone.

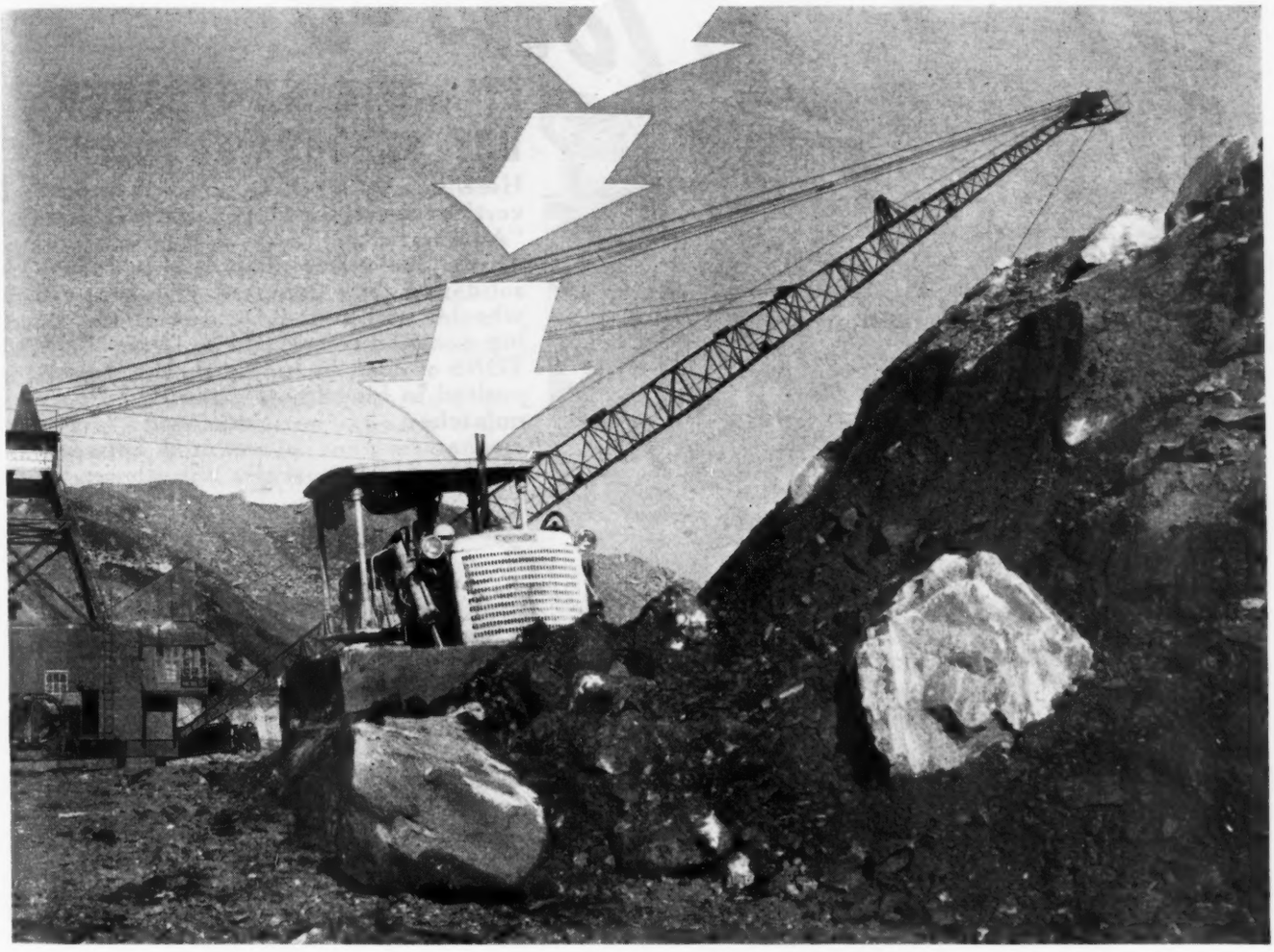
Look into Whitney Universal Mining Chains for your loaders. Investigate, too, Whitney Power Transmission Chains, Conveyor Chains and Cut Tooth Sprockets . . . the all-steel drives, built to help you build record tonnage. Write for complete information today.

Whitney Chain & Mfg. Co.

Division of Whitney-Hanson Industries, Inc.
210 HAMILTON STREET, HARTFORD 2, CONNECTICUT

"DOES ALL YOU CLAIM FOR IT—*AND MORE*"

SAYS ITS OWNER



A "Caterpillar" Diesel D7 Tractor, equipped with bulldozer—one of the fleet of "Caterpillar" Diesel Tractors and Engines owned by the Capparell Stripping and Construction Co., Hazleton, Pa.

The Capparell Stripping and Construction Company uses this "Caterpillar" Diesel D7 Tractor, equipped with a bulldozer, to work around the dragline in their strip-mining operations near Heckscherville, Pa. For fourteen hard hours a day, it keeps itself busy on its own jobs—and other machines busy on theirs. The owner says: "Our 'Caterpillar' Diesels take a real beating in these rocks and boulders, but they're doing everything you claim for them and more, too."

The D7 bunches overburden for the bucket, cleans the face of the coal, smooths the path for the Monighan and builds roads and drainage ditches. And if the operation were one where railroads are built into the pit, you'd find the versatile D7 side-shifting tracks and moving and switching cars.

"Caterpillar" Diesels are proved money-makers and "Caterpillar" dealers are proved sources of unexcelled parts and mechanical service.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

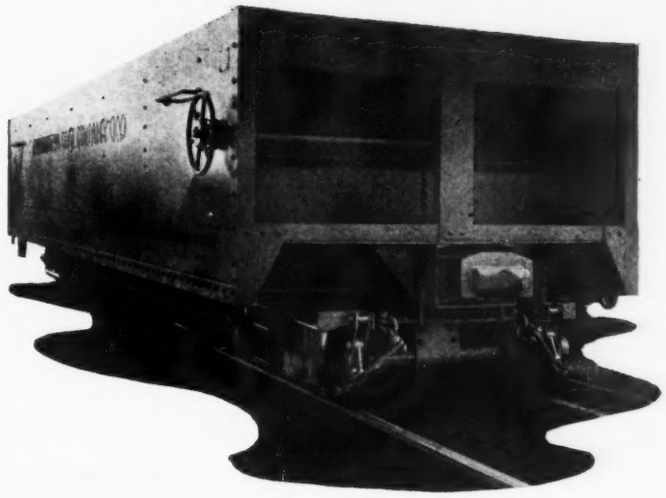
ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

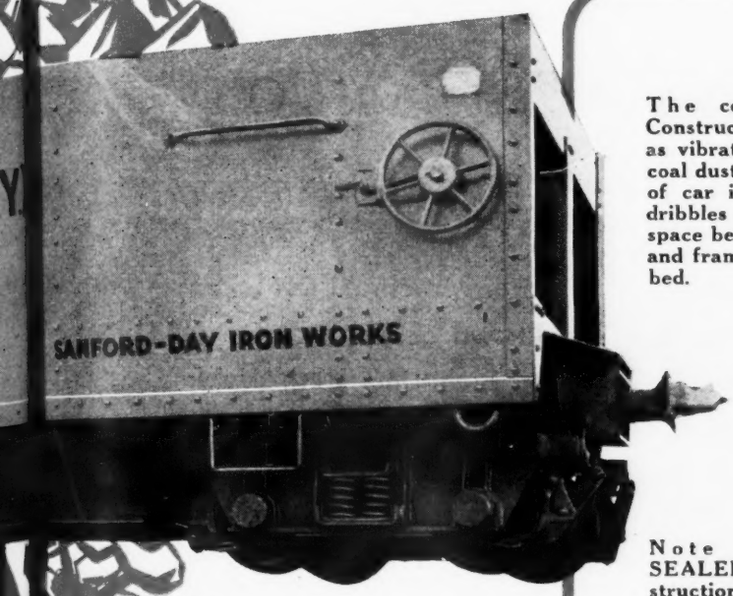
without losing an ounce of dust

car with two unlatching hooks for fool-proofness and safety. Furthermore, this big car is completely sealed against dust leakage. Prevents coal dust from sifting out and accumulating on track bed. Eliminates costly track clean-up . . . means safer, dustless haulage.

The car is equipped with Ohio-Brass Automatic Couplers, Timken Bearing Trucks and parking brakes on one 4-wheel truck. It measures 30 ft. in length; 8 ft. in width and is 6 ft. 2 in. high above rails.

If you are thinking of changing over to BIG cars, you cannot afford to overlook S-D "Automatics" . . . unquestionably the industry's most modern and efficient mine car.





The conventional Construction. Note as vibration shakes coal dust down side of car it naturally dribbles through space between door and frame, to track bed.

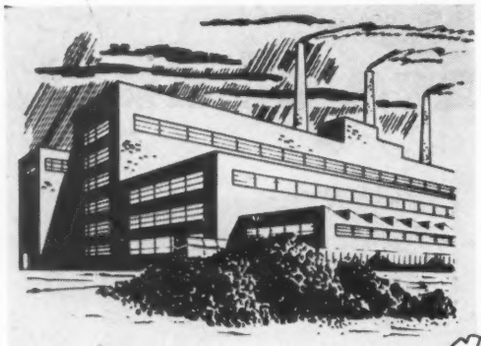
Conventional Automatic

Note in our SEALED car, construction dust is carried across space by our patented "dust-roof". Dust is deposited in door to be dumped with other coal.

S-D's New Sealed Automatic Design

Sanford-Day Iron Works

KNOXVILLE TENNESSEE



For longer life of industrial coal handling equipment--

Preparation must include

CORROSION PROTECTION

with PERMATREAT Coal Spray

FREEZE PROOFING

FASTER DEWATERING

BETTER STOKER FEED

CLEAN HANDLING

LESS WINDAGE LOSS

The protective action of Permatreat Coal Spray helps prevent breakdown of stoker and other equipment due to corrosion. Unloading trouble, caused by freezing in hopper cars, is reduced; coal is stored and handled easier. Permatreat Coal Spray seals fly-dust to coal, eliminates the dust nuisance.

One of our representatives, highly trained in coal treating, will be glad to give you facts on treating of industrial coals. Write today; no obligation.

Ashland PERMATREAT COAL SPRAY seals in dust

ASHLAND OIL & REFINING COMPANY

Ashland, Kentucky

BIG 300 H.P.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournadozer—Trademark

See your LeTourneau Distributor NOW about the "BIG

TOURNADOZER

WHEN it comes to stripping big quantities of earth in a hurry, compare the production advantages you get with the size, power, and speed of LeTourneau's new "Big B" Tournadozer.

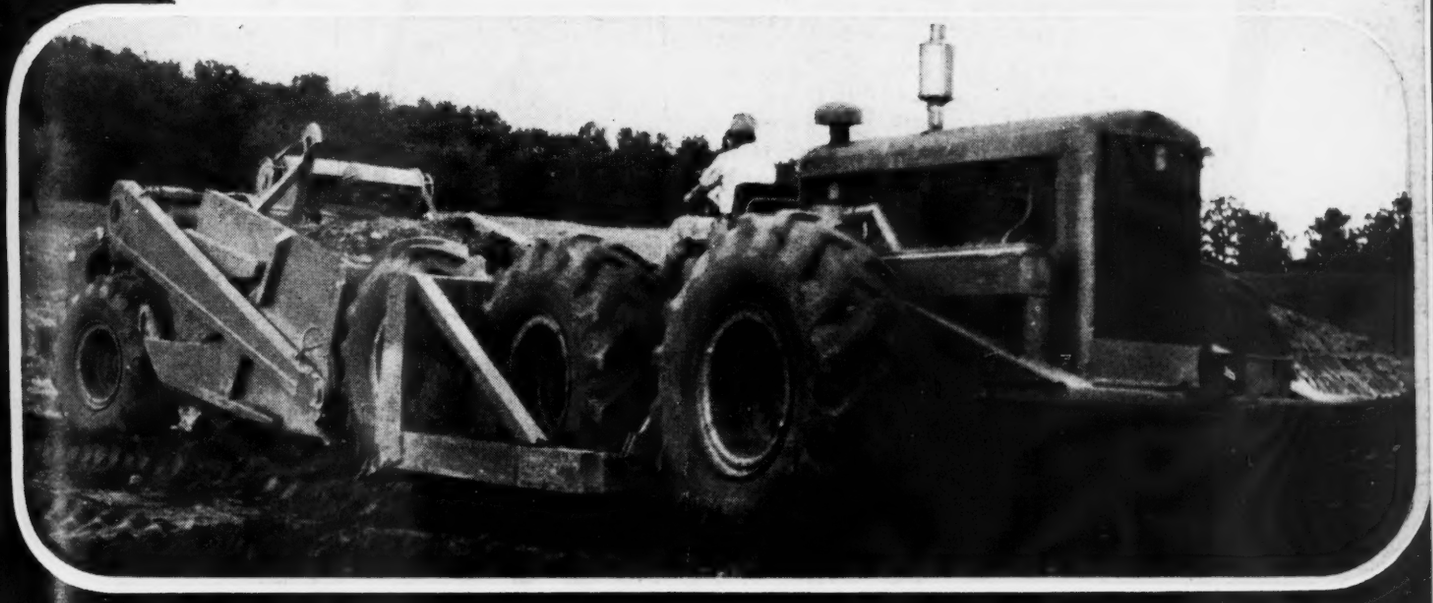
Powered by a husky 300 h.p. Diesel, with constant drive on 4 giant tires, this 25-ton, dozer handles up to 5½ cubic yards with its huge blade . . . push loads up to 30-yards into a B Tournapull in less than one minute. In addition, "Big B's" superior speed of 13.6 m.p.h. forward and reverse—plus instantaneous gear selection and pushbutton electric blade control—mean faster cycles, increased mobility, bigger yardage at less cost.

So when you *think BIG . . . buy BIG!* Buy the "Big B" Tournadozer, available now from your nearby LeTourneau Distributor!

R. G. LeTOURNEAU, Inc.
Peoria, Illinois

Quick Facts

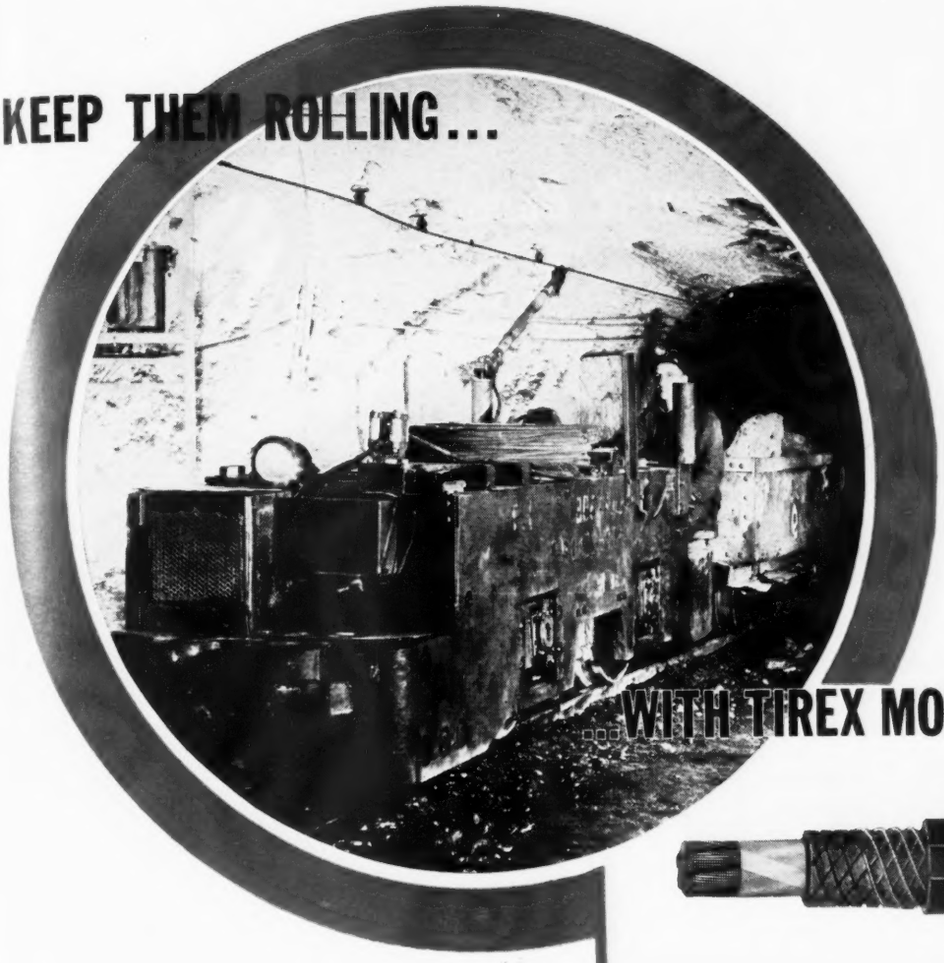
- 300 h.p. Diesel engine
- 24.00 x 29 giant tires
- 25 ton working weight
- 5½ cu. yd. capacity blade
- 13.6 MPH forward and reverse
- Instantaneous gear selection
- 4-wheel drive...4-wheel brakes
- Electric blade control



IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

B" TOURNADOZER

KEEP THEM ROLLING...



...WITH TIREX MOTOR LEAD CABLE

Failures of cables carrying power down trolley poles to the motor controls of mine locomotives take a heavy toll. While they sideline your machines they push up operating costs and cut down production.

But you can avoid such breakdowns, keep output high and expenses low, by equipping your machines with a cable designed especially for the job. That cable is Simplex-TIREX Motor Lead Cable — tough, flexible, and clean-stripping.

Yes tough, because its reinforced jacket of Selenium Neoprene Armor is carefully compounded to withstand abrasion and exposure to oils, grease, acids, and heat. It will not support combustion.

Flexible, because the copper wires that make up the conductor are properly stranded together; an important feature due to the limited space in which such cables must be installed.

Clean-stripping, because of a paper tape separator between conductor and insulation which allows quick, neat stripping of the insulation and leaves the conductor clean and ready for connecting or soldering to terminals or battery lugs.

Simplex-TIREX Motor Lead Cables can be relied upon for the same dependability, safety, and economy that have earned for TIREX Locomotive Cables a reputation for sound performance. Together, they team up to keep coal moving out and profits coming in. For detailed information on these and other TIREX Cables for mining service, write today for catalog #994.

Simplex WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

Any V-BELT Changes Shape *when it Bends*

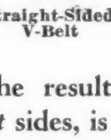
Prove this yourself!

That's Why the CONCAVE SIDE

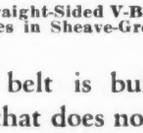
(U. S. PATENT NO. 1813698)

Gives You 2 Big SAVINGS!

Bend *any* V-Belt and *f e e l* it change shape. The top, under tension, *narrows*. The body, under compression, *widens*. The sides of the belt bulge out.



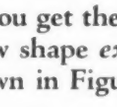
Straight-Sided V-Belt



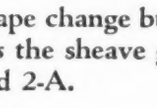
Straight-Sided V-Belt Bulges in Sheave-Groove.

The result, if the belt is built with *straight* sides, is a shape that does not fit the sheave groove — as shown in Figures 1 and 1-A, above.

Now, bend the V-Belt built with the precisely engineered Concave Side (U. S. Patent No. 1813698) — the Gates Vulco Rope.



Gates Vulco Rope With Concave Side.



No Side Bulge. Precise Fit in Sheave Groove.

You get the same shape change but *now* the new shape *exactly fits* the sheave groove as shown in Figures 2 and 2-A.

Results— (1) *Uniform* side-wall wear; *longer* life. (2) *Full* side-wall grip on the pulley; carries heavier loads and sudden load increases without slippage—a big increase in drive efficiency—saving belt wear a n d also saving power!

REG U S PAT OFF.

The Mark of SPECIALIZED Research

The Concave Side is MORE IMPORTANT NOW Than Ever Before

Because the *sides* of a V-Belt are what actually *drive* the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley *directly* through the belt's side-walls.

Now that Gates *SPECIALIZED* Research has m a d e available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side naturally delivers greater savings today than ever before.

48-2

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

THE GATES RUBBER COMPANY
DENVER, U.S.A.
"The World's Largest Makers of V-Belts"

. . . with the same dragline when equipped with a Page AUTOMATIC

Rated capacity cu. yds.	No. of 24-hour days in use	No. of bucket loads in period worked	User's Engr's estimate of cu. yds. per bucket load	Total cu. yds. excavated in period worked	Cu. yds. excavated in 24-hour day	Average number of bucket loads per hour
25 Cu. Yd. Competing Bucket	15 consecutive days	19,685*	20.2	397,637	26,509	54.68
25 Cu. Yd. Page Automatic	16 consecutive days	23,424*	22.8	534,067	33,373	61.0

*Recorded by Esterline-Angus

On an actual 16 consecutive day run with all conditions alike — the same dragline, the same operators and the same material, a 25 cu. yd. Page AUTOMATIC Dragline Bucket outperformed a competitive bucket of the same rated size by a wide margin. The table gives all the facts found by a well-known coal company which made the test to determine the best bucket for their own stripping operations.

Assuming that both buckets carried equal loads, the Page AUTOMATIC made 11.5% more swings per hour. Considering both the increased number of swings and larger loads, the Page AUTOMATIC moved 25.9% more material than the competing bucket.

The extra bucket loads were obtained by the AUTOMATIC because of its quick loading features. Generally, little more than two lengths of the bucket are required to pick up a full load.

The increased yardage moved with the AUTOMATIC was due to its ability to obtain full loads on every trip while the competing bucket did not load the back end once out of ten times.

No effort was made during the test to determine the amount of dragline pull necessary to operate either bucket. However, other installations have proved that a Page AUTOMATIC requires up to 25% less dragline pull than the usual old style bucket.

Whether you need a small bucket or a big one, you can always move more yardage at less cost with a Page AUTOMATIC.

PAGE ENGINEERING COMPANY, Clearing Post Office, Chicago, Illinois

Speaking the TRUTH about coal

Here's how our Speakers Bureau can serve YOU right in your own community

Did you know about our Speakers Bureau? It was organized over three years ago, and has now expanded to a group of more than 300 members—coal executives and men of long experience in the bituminous industry.

In the last 12 months these men have given more than 300 speeches in 26 states. The chances are that one of them is near your district, ready to help you gain the benefits of an educated and sympathetic community by giving an interesting, informative talk on the coal industry.

Why not write a request now for one of our members to speak at your civic or business-luncheon club, your church or other local gathering? If you would prefer to speak yourself, we will be happy to furnish you with all necessary materials.

other services—

Movies
Classroom Helps
Women's Club Programs
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NATIONAL in scope...

make them LOCAL in effect!

BITUMINOUS COAL INSTITUTE

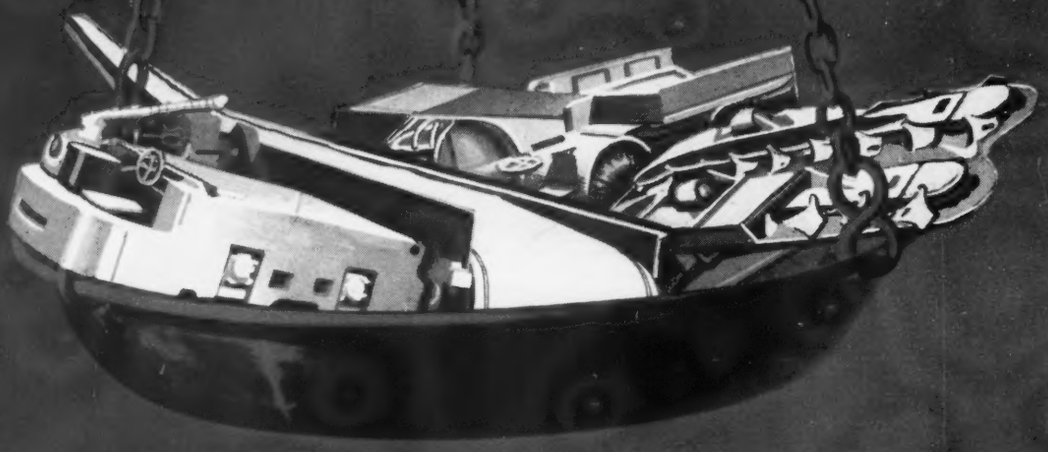
A Department of NATIONAL COAL ASSOCIATION

Southern Building, Washington 5, D. C.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA

For Continuing Profits

IN COMPETITIVE MARKETS



Balance *Increased* MECHANIZATION

Modern full-seam mechanized mining cuts costs underground. No doubt about that!

But it also sends up raw coal with a high and fluctuating refuse content. Which, in turn, demands high-capacity precision cleaning to keep the prepared coal competitive both as to ash and sulphur content and price . . . now and into the future.

Heavy-Media Separation is the only preparation process that can cope with large and variable quantities of refuse in run-of-mine coal over the entire gravity range without loss of capacity or reduction in cleaning efficiency.

A strong statement, yes! But as results have again and again shown: *Only Heavy-Media Separation provides continuous withdrawal of large and variable amounts of refuse without volumetric limitation.* In existing plants this process has treated many millions of tons of feed from which *the sink removed runs three times the tonnage of the float.* It has even operated profitably on a product formerly discarded as a final refuse by a less efficient cleaning method . . . feed averaging 90% refuse!

Heavy-Media Separation closely duplicates washability curves . . . making a sharp separation over a full size-range at any specific gravity from 1.25 to 3.75 . . . maintaining any predetermined density continuously within ± 0.01. No other process approaches this efficiency. Yet if specifications change, the separating gravity can be quickly and easily adjusted.

For all these advantages, Heavy-Media Separation carries no compensating penalties. By continuous reclamation, loss of the low-cost separating medium is negligible. Equipment is standard, time proved. Operators need no unusual skills. Labor costs per ton are infinitesimal. Capital costs per-

AMERICAN *Cyanamid* COMPANY

30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.

with Precision PREPARATION

mit use on any seam worth mechanizing! Semi-portable plants from 5 to 125 tons per hour capacity are available for prompt delivery. For larger plants, Heavy-Media Separation units can be quickly designed on the basis of accumulated experience by a number of engineering firms.

Today, 30 Heavy-Media Separation plants are in operation treating metallic and non-metallic ores and preparing bituminous and anthracite coal. Seventeen new plants are being designed or are under construction for operation by the end of next year. Eight of these will be employed for coal preparation.

Cyanamid offers a complete range of Separation Processes by Gravity Difference (Heavy-Media Separation and the Dutch State Mines Cyclone Separator) for new cleaning plants or as adjuncts to present washers.

With a process for every size and specification, and no self-interest in equipment manufacture or plant construction, Cyanamid offers unprejudiced counsel on coal cleaning based on tests of your coal by various preparation processes in the Cyanamid Mineral Dressing Laboratory at Stamford, Conn.

We invite discussion and stand ready to run carload tests on your coal; to cooperate with engineers of your choice in the design of the most efficient separation units into your cleaning plant, and to provide the assistance of Cyanamid Field Engineers in tuning up the installation.

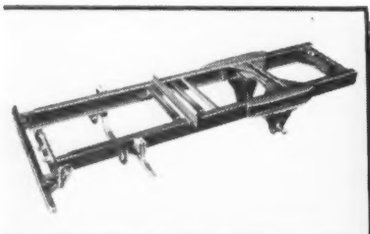
MINERAL DRESSING NOTES No. 16, COAL PREPARATION contains 38 pages of interesting descriptive data and test results on Heavy-Media Separation Processes and the Dutch State Mines Cyclone Separator Processes. A copy will be forwarded upon request and subsequent Technical Papers of the Cyanamid Mineral Dressing Laboratory sent to you as issued.

"WHY SHIMMY, JIMMY? GET A KENWORTH!"

Better cooling is assured by Kenworth's tube and fin high-efficiency type radiators.

Greater comfort for the driver has been designed into each Kenworth truck.

Kenworth trucks need no fuse replacements because of manually reset circuit breakers.



Kenworth truck frames provide ruggedness and strength without rigidity.

If a truck's hard to steer, it's tough on the driver, reduces speed and maneuverability, cuts down on efficiency. That's why Kenworth places such emphasis on engineering and building the best steering heavy duty motor trucks on the market today. There's more to this than meets the eye. Good steering starts with a straight and square frame, and the attachment of the axles to the frame. The steering gear, itself, must be of ample size, reduction and advanced design — so Kenworth has standardized on a steering gear with these qualifications, plus a ratio of 28.4:1 and anti-friction bearing equipped throughout.

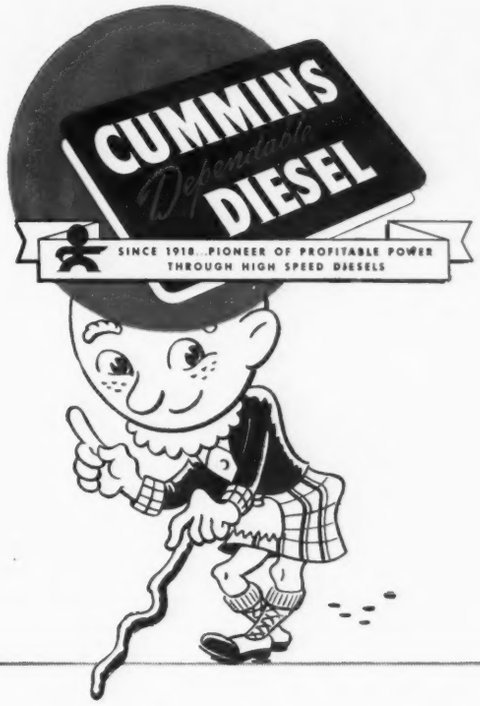
Oversized components combined with proper draglink, steering and pitman arm layout and a spring construction to maintain that "mystic point" of steering perfection are mandatory in building easy and positive control into a truck. Each Kenworth truck steers firmly, responds quickly and easily — just one more reason why *there's more* **WORTH *in* KENWORTH.**

KENWORTH

TRUCKS BUSES

FACTORY AND HOME OFFICE: SEATTLE, U.S.A.
DISTRIBUTORS IN THE UNITED STATES AND MOST FOREIGN COUNTRIES

Cummins Diesels Save Fuel



Compare the cost! **Operate a Cummins Diesel alongside other engines—diesel, gasoline, or butane—then check your fuel bills. Here's what our customers report:**

Annual Savings: $2620.00

Yearly fuel costs for a Cummins-powered truck used on an off-highway haul, consisting of three 22-mile round trips per day, are $2620.00 less than the fuel costs for a gasoline-powered truck used on the same haul. That's because the Cummins-powered truck shows a daily fuel cost of $3.47 against $13.55 per day for the gas job.

Annual Savings: $1138.80

Yearly fuel costs for a Cummins-powered earth mover on a multi-million-yard earth-moving project are $1138.80 less than the fuel costs for an earth mover powered by another make of diesel and doing similar work. That's because the Cummins-powered unit, while making more trips and carrying heavier loads, uses only 25.7 gallons of fuel per shift against 33.5 gallons per shift for the other diesel.

CUMMINS ENGINE COMPANY, INC., • COLUMBUS, INDIANA

The fewer parts, the fewer headaches

We remember what one man said the first time he saw Bethlehem prefabricated track. "I was expecting something pretty complicated. Why, there's nothing complicated about *that!*"

True. The fewer parts, the fewer headaches for the customer. The simpler a layout is, the easier it is to install, maintain, and remove. But this simplicity—something you'll find in *all* Bethlehem prefabricated track—is a matter of research and thorough planning. There's more to it than meets the eye.

Let's say you're considering additions to your track system, or changes in the present one. You've asked a Bethlehem engineer to look over your workings. He does; he spends as many days as the job requires. Then he plans a layout for your individual mine; for your individual needs. By patient, careful study and close figuring, he keeps it just as simple and inexpensive as possible. No extra doodads or fancy, costly trimmings.

When he submits his plan, it's pretty apt to be one you'll approve without many changes. When you've said "Go ahead," Bethlehem precurves and precuts the rails. The track reaches you ready to assemble, and you'll be surprised at what an easy job it is. Special rails are numbered; expert trackmen are not required for assembly.

Once in, it begins to pay off in faster, safer haulage . . . fewer maintenance problems . . . lower cost per ton hauled. Our bet is, you'll like everything about it—from its simplicity to its overall efficiency.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

If you're interested in valves that will give you any or all of these operating advantages then you'll be interested in

NON-CONTAMINATING

MINIMUM MAINTENANCE

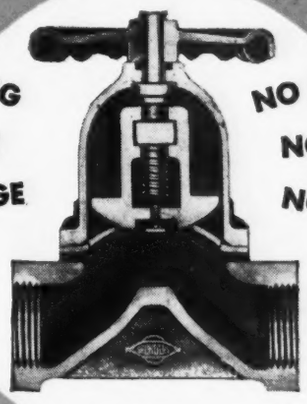
NO VALVE STEM LEAKAGE

NO CORROSION

NO CLOGGING

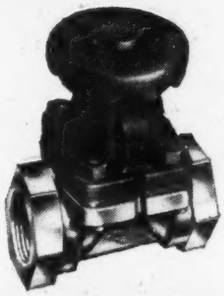
NO SEEPAGE

GRINNELL - SAUNDERS DIAPHRAGM VALVES



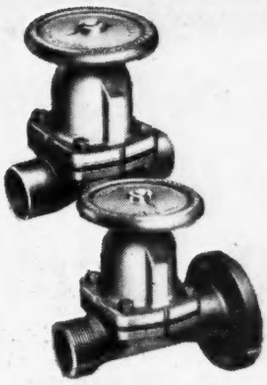
Valve Open

Valve Closed



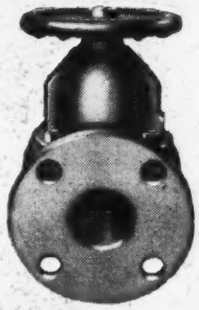
FOR CHEMICALS

Stainless Steel valves with special diaphragms are handling satisfactorily such corrosive chemicals as phosphoric, acetic and chromic acids.



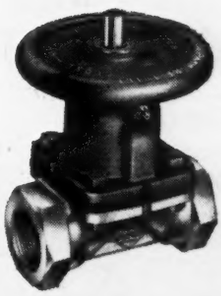
FOR BEVERAGES

Bronze valves with socket ends (left) and with hose threaded end (right), both with special white rubber diaphragms, are stopping leaks and cutting maintenance to the bone in breweries handling millions of barrels of beer.



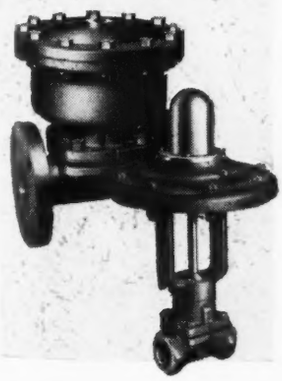
FOR PULP and PAPER

Rubber lined valves are setting new performance records handling pulp, alum and sulphuric acids in paper mills.



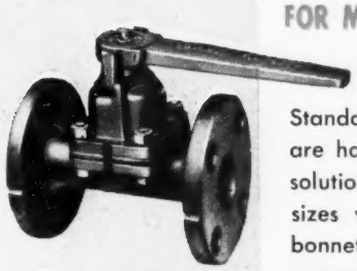
FOR TEXTILE PLANTS

Aluminum body valves with rising stems have won enthusiastic approval in bleacheries handling hydrogen peroxide and other chemicals.



FOR FOODS

Piston-operated valves (left) and air motor operated valves (right), both glass lined and with proper diaphragms, are providing remote control in plants handling sodium chloride, sodium hydroxide, sulphuric acid and fruit juices.



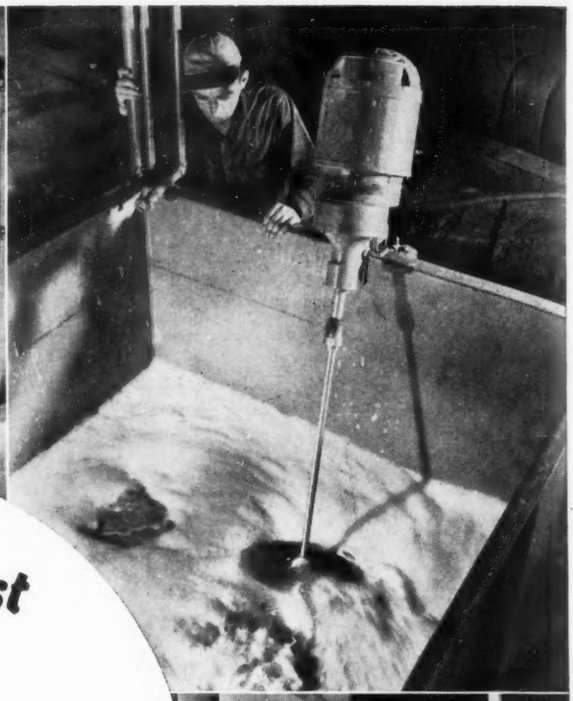
FOR MINES

Standard rubber-lined valves are handling highly abrasive solutions and slurries. Small sizes with quick-operating bonnets are widely used on compressed air lines to prevent leakage.

Grinnell-Saunders Diaphragm Valves may eliminate valve troubles and cut valve maintenance on your pipe lines. Available in any combination of valve bodies and linings, diaphragms and operating mechanisms. State your requirements or ask for Catalog 2-S on "Grinnell-Saunders Diaphragm Valves". Grinnell Company, Inc., Providence 1, R. I. Branch warehouses in principal cities.

GRINNELL

WHENEVER PIPING IS INVOLVED



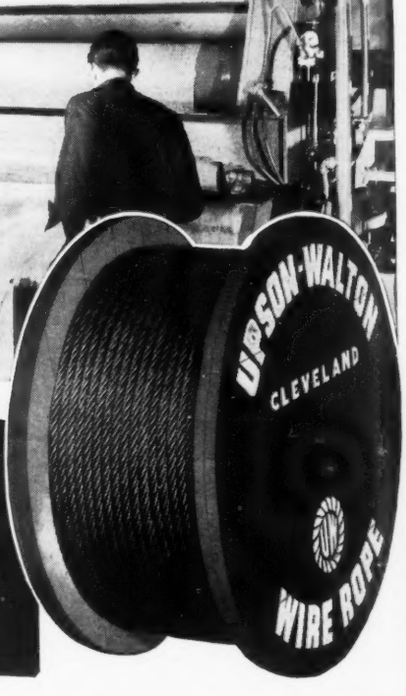
As seen in
America's newest and finest
Brattice Cloth Mill
making the new

UPSON-WALTON *Brattice Cloth*

★

Not merely dry—it's DRY PROOFED under ELECTRONIC CONTROL

Write for free copy of "Brattice Cloth Facts"



THE UPSON-WALTON COMPANY

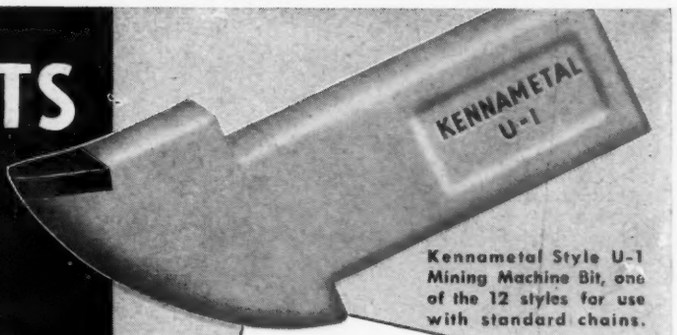
Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street, New York 4 | 3525 West Grand Ave., Chicago 51 | 241 Oliver Building, Pittsburgh 22

KENNAMETAL BITS

- **Last Longer**
- **Cut Faster**
- **Save Power**



Kennametal Style U-1 Mining Machine Bit, one of the 12 styles for use with standard chains.

Longer Bit Wear!

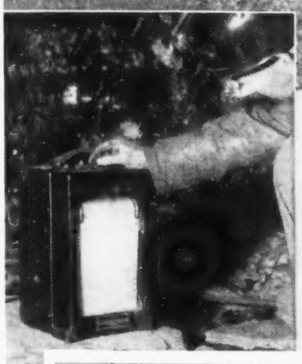
For example: Kennametal bits reduce number of bit changes in the ratio of:

- 42 to 1 — Alma Seam, W. Va.
- 44 to 1 — Pittsburgh Seam, Penna.
- 30 to 1 — #9 Seam, Kentucky

Faster Cutting!

For example: Kennametal Bits reduce cutting time, per place:

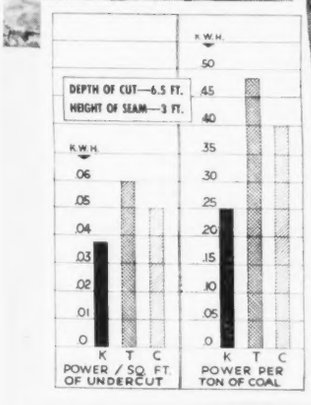
- 44% — #6 Seam, Ohio
- 28% — Pittsburgh Seam, Penna.
- 37% — Thacker Seam, W. Va.



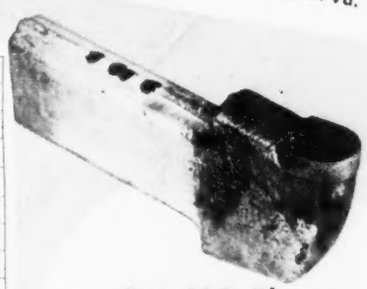
Less Power!

For example: Kennametal Bits reduce power consumption:

- 31% — Pittsburgh Seam, Penna.
- 40% — #2 Gas Seam, W. Va.
- 51% — Pittsburgh Seam, W. Va.



Tested on the above Esterline Angus Watt-Hour Meter Kennametal U-8 bits (K) reduced power consumption 43% as compared to (T) Throw-Away bits, and (C) Conventional bits.



Cut 100 Places

Actual photograph of a Kennametal U-8 bit, typical of a complete set that cut 100 places in the Winifrede Seam in West Virginia before it was sharpened. Obviously the bits will cut several hundred more places. In the same seam conventional bits cut one place per change.

Kennametal Mining Machine Bits help you increase tonnage because they cut faster, and stay sharp up to 100 times longer than conventional bits. Machines require less power, and repairs are materially reduced. Kennametal Bits consistently outperform other bits because their cutting edges are solid Kennametal, the amazingly durable cemented carbide that boasts diamond-like hardness, and has high resistance to shock, abrasion and wear. Many mine operators report that Kennametal bit cost is ⅓ to ½ lower.

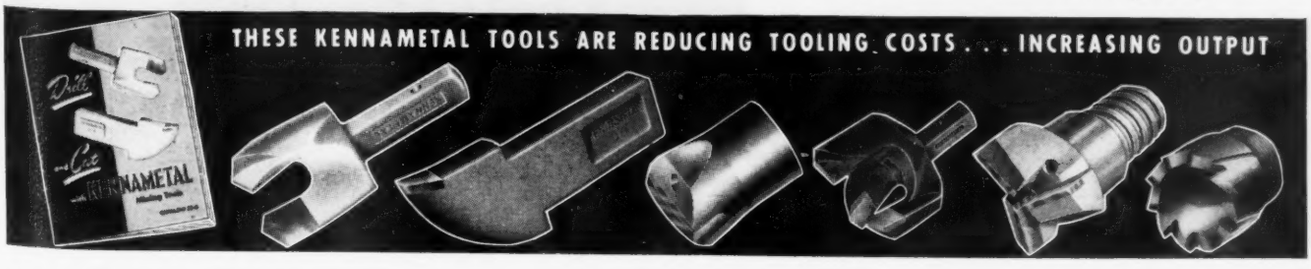
Find out how Kennametal Mining Machine Bits can increase tonnage and lower bit costs for *you*. A Kennametal Sales-Service Engineer will be glad to give you a demonstration.

MINING DIVISION

KENNAMETAL *Inc.* ®

Latrobe, Pa.

The World's Largest Manufacturer of Cemented Carbide Mining Tools




It's really in
AMERICA NEEDS MORE COAL

the future...

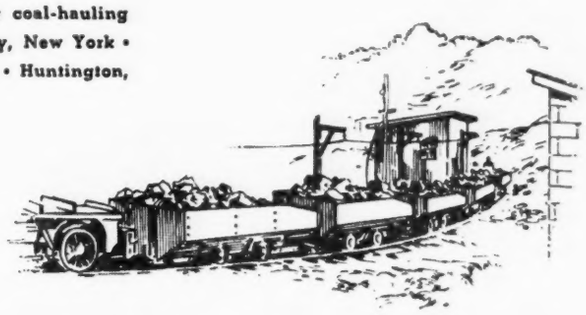
OIL from COAL

Funny thing about this crystal ball...it magnifies.

Right now, oil-from-coal is a thing of the future. It's coming, and it's going to be big...but no one knows just when. You'll mine the coal for it when you see the plants, and not before. It may not affect the Industry for several years, and the peak demand may then be still more years away. But whether producing for new conversion processes or other and more immediate demands, mine operations live in a market that is constantly hungry for more coal.

Right now it calls for more new mine cars...faster, tougher, more productive mine cars. *Tougher*—a.c.f. Mine Cars have *welded* end-sills. *Faster*—a.c.f. Cars start easier, roll easier with *anti-friction* bearings, *two-way* bumpers. *More Productive*—a.c.f. Drop-Bottom Cars dump a ton of coal a second—no delays—your loaders keep busy!

A nearby a.c.f. representative is ready to assist with your coal-hauling problems. Call on him. American Car and Foundry Company, New York • Chicago • Cleveland • Washington • St. Louis • Philadelphia • Huntington, W. Va. • Berwick, Pa. • Pittsburgh • San Francisco.



a.c.f. **MINE CARS**

for Greater Coal Output

PROBLEM—To keep expensive Diesel Powered shovels, draglines, bulldozers and trucks on the job. To reduce or prevent costly engine breakdowns caused by "carbon," sludge or oxidation products.

SOLUTION—Cities Service Heavy Duty Diesel Engine Lubricants. They are made from the finest crudes, specially treated and chemically fortified to fight off these carbon deposits. By resisting oxidation they also resist the formation of acids corrosive to bearings.

TOP PERFORMANCE...

thru top quality lubricants

PROBLEM—To find an Effective Wire Rope and Gear Compound.

SOLUTION—The operating conditions involved in strip mining require lubricants able to protect open gears and wire rope against rust wear and breakage. Maintenance time and cable expense can be reduced with a tough gear and cable compound that doesn't require heating to apply. Cities Service Lubrication Engineers are proving this daily with Cisco Compounds #3-Z and 5-Z.

Cities Service Oil Company
Sixty Wall Tower, Room 267
New York City 5, N. Y.

FREE—Please send me without obligation your Diesel Engine Lubrication Booklet.

Name_____

Company Name_____

Street Address_____

City_____ Postal Zone____ State_____

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS


THE TIGER BRAND SPECIALIST SAYS—
"If your wire
USS
AMERICAN
TIGER BRAND
WIRE ROPE
UNITED STATES STEEL

rope takes a beating like this, you ought to check the application"

"The foreman on this job was blowing his top. He was already behind in production when this machine went down. He swore that the wire rope was no good.

"We took a look at the sheaves. They were badly worn. Then I asked him, 'When did you check those grooves?' Nobody on the job could remember when the sheaves had been regrooved.

"We got out a gage. Sure enough, that's where the trouble was. The grooves had worn down so that the proper size gage nowhere near bottomed. Now they're regrooving and I sold him on the idea of letting me check all his equipment. I'll bet we keep his business and his ropes will give twice the service."

Are you sure you have the RIGHT wire rope for your job!

Are you convinced beyond a doubt that your wire ropes are operating at the lowest obtainable unit cost?

Are you sure that your equipment is contributing fully to long, safe rope life?

If not, you should have a check-up by a TIGER BRAND Specialist—a thoroughly experienced field service engineer.

To show you how the proper application of wire rope can save you money, we have prepared a new booklet to help you check your own operating conditions.

SEND FOR NEW FREE BOOKLET

American Steel & Wire Company
Rockefeller Building, Dept. J-12
Cleveland 13, Ohio

Gentlemen:

Please send me a copy of your booklet, "Valuable Facts about the use and care of Wire Rope."

Name.....

Company.....

Position.....

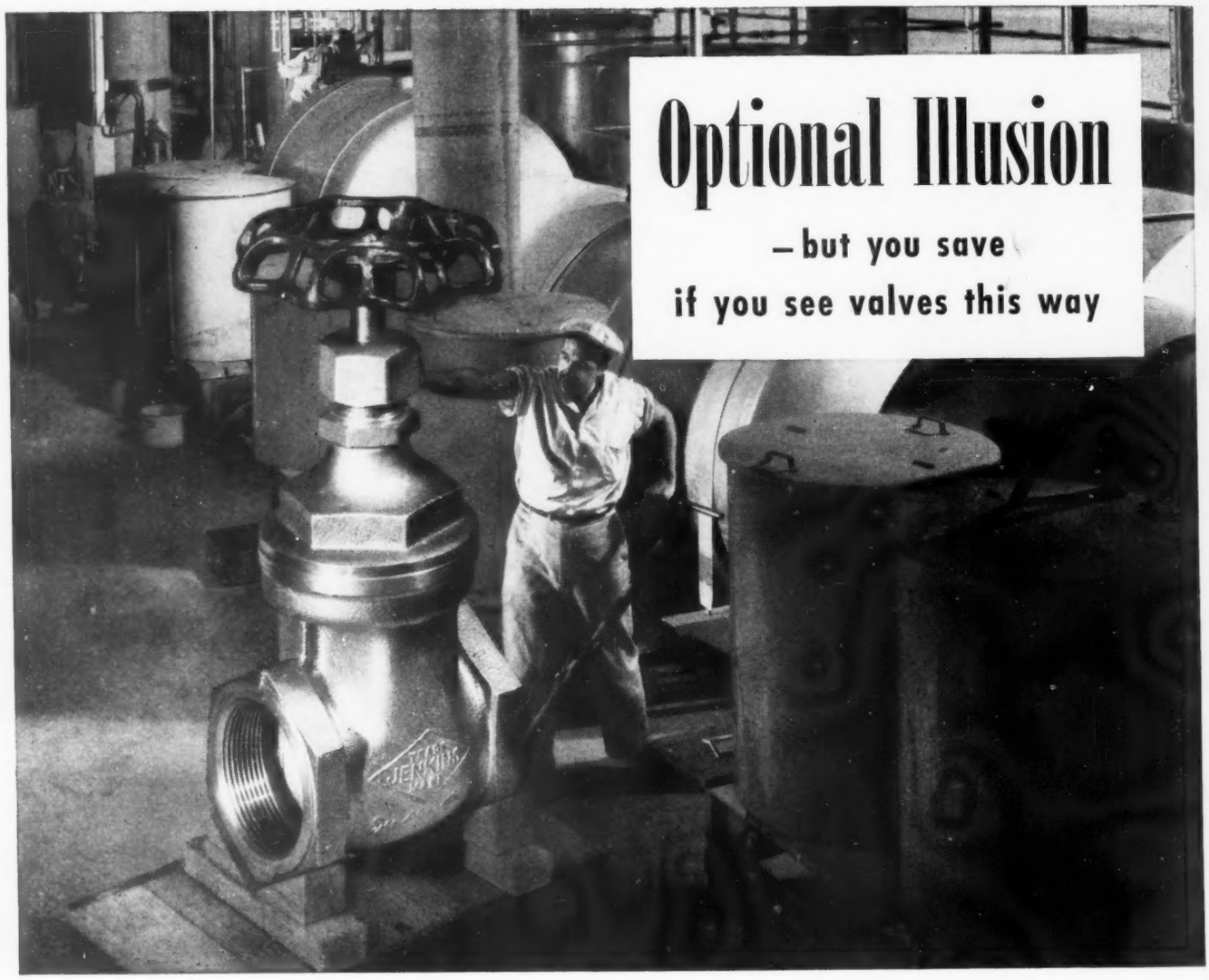
Address.....

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL



THERE ARE TWO WAYS of regarding the valves in your plant. You can think of the relatively small cost of a single valve, and dismiss them as a minor, "petty cash" investment. Or, you can think of *all* valves in your plant as *one* valve, as pictured, by photo-magic, in this pharmaceutical plant, and see them in proper perspective.

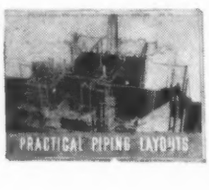
YOU'LL FIND IT PAYS to take the latter view, for in *any* plant, *any* building where fluid control is involved, valves, collectively, are as important, in terms of investment and operating expense, as larger plant units, and should be selected with the same sharp eye to quality and economy.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. *Sold through leading Industrial Distributors.*

•

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.



"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.

LOOK FOR THIS JENKINS TRADE MARK DIAMOND MARK

SINCE 1864 Jenkins Bros

JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

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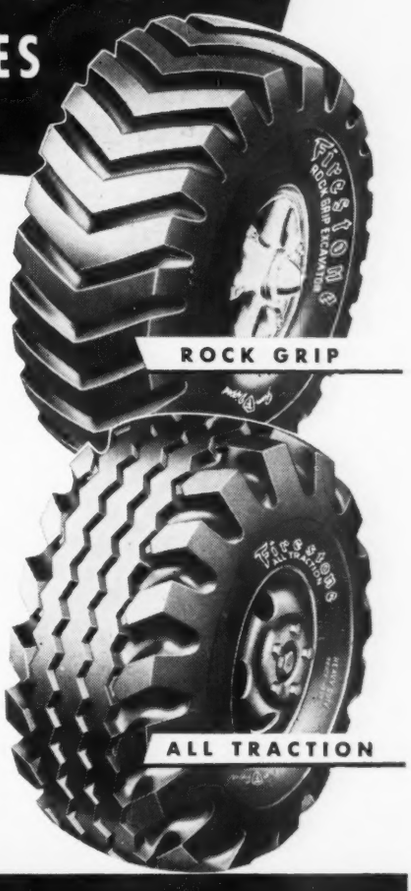

ON ALL types of road building and grading jobs, Firestone Ground Grip Tires save money because they provide the traction to move more dirt and they have the strength and durability to stay on the job with a minimum of "downtime."

All Firestone Off-the-Highway Tires . . . the Rock Grip, the Ground Grip, and the All-Traction . . . are time savers because they furnish the performance to make your equipment move faster . . . do more work. They cut costly downtime to a minimum because they are engineered and built to stand up on jobs where other tires can't "take it."

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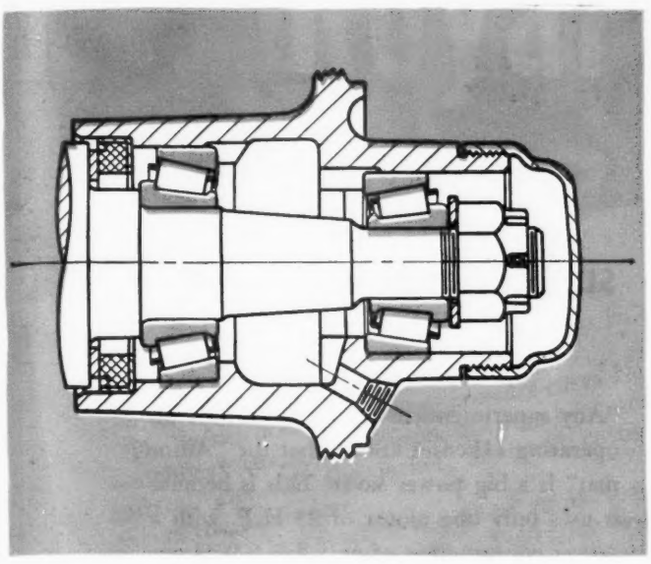
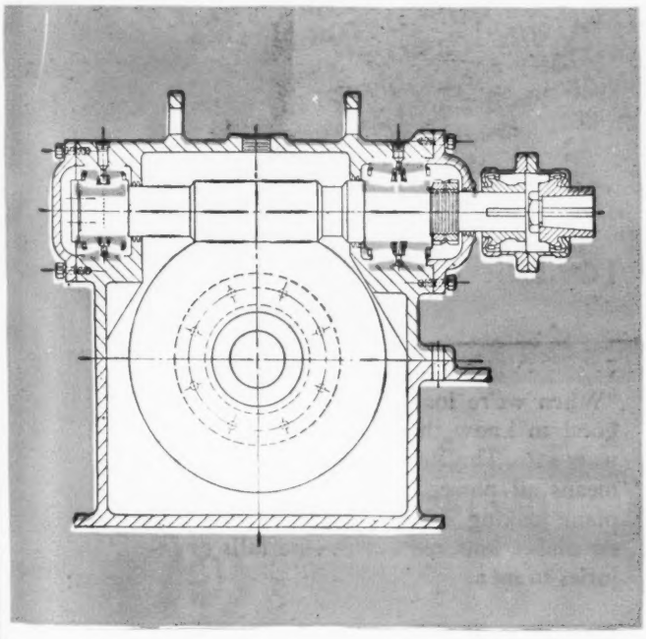
Firestone OFF-THE-HIGHWAY TIRES

How to carry combinations of radial and thrust loads



TRACTOR FRONT WHEEL *in which both thrust and radial loads are carried on single row Timken bearings. From whichever way the load may come, it will be handled with minimum friction and wear.*



APPLICATION *of Timken Bearings on the worm shaft of a worm gear drive. The load on the worm shaft bearings, due to the operation of the worm, is primarily thrust. There is considerable radial load however, arising from the separating force of the gears and also possibly from overhung driving loads. This is another application for which the tapered roller bearing is ideal.*

THESE drawings show how Timken tapered roller bearings are effectively used where both radial and thrust loads must be carried. They may give you an idea for projects now on your boards.

Because it is a *roller* bearing, the Timken bearing can carry the heaviest loads. Because its rolls are *tapered,* it can carry both radial and thrust loads in any combination.

From whichever direction the loads may come, this tapered design enables the Timken bearing to carry them, one at a time or simultaneously. The cost of providing a separate type of bearing for each load is eliminated. Bearing housings and mountings are simplified, with a saving in cost, weight, and space.

For help in putting these important advantages of Timken bearings to work in the product you're designing, call upon the confidential service of the Timken engineer. He will help you select the precisely correct bearing for your job.

Remember, Timken is the only bearing manufacturer which makes its own steel. And Timken is the acknowledged leader in: **1.** advanced design; **2.** precision manufacture; **3.** rigid quality control; **4.** special analysis steels.

Additional copies of this page and further information on this or other applications of Timken bearings are yours for the asking. Write — The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN GIVES YOU THESE IMPORTANT FEATURES:

1. TRUE ROLLING MOTION
All lines drawn coincident with the faces of rollers, cone and cup meet at a common point on the axis of the bearing.

2. GREATER LOAD CAPACITY
Load is distributed along full length of roller, giving greater capacity, precision, and rigidity, with less wear and distortion.

TIMKEN
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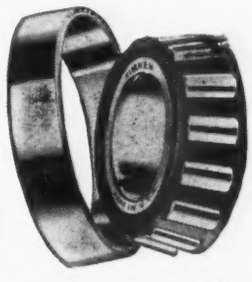
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◐ AND THRUST ⊂⊃ LOADS OR ANY COMBINATION

HERE IS WHAT MEN OF EXPERIENCE WILL TELL YOU ABOUT THE WHALEY "AUTOMAT" . . .

1.

OPERATING MAN

"I know from experience that the smoothest, most dependable loading action is the Whaley "Automat" Shovel Action. In coal or rock, you get equally effective service and consistent, maximum production."

2.

SUPERINTENDENT

"Any superintendent who keeps an eye on operating expenses knows that the "Automat" is a big power saver. This is because it uses only one motor of 25 H.P. with a power consumption of only 1/5 KWH per ton of material loaded."

3.

FOREMAN

"Limited headroom is no problem for the "Automat." Its parallel lift rear conveyor, always parallel to the top of the car, takes advantage of every inch of headroom and makes it possible to load maximum height cars to their full capacity."

4.

LOADER OPERATOR

"When we're loading in close places, it's good to know that the "Automat" is always safe. The Vertical Lift Shovel Action means all power is directed in a vertical plane making side-kicking impossible . . . no timber knocked out . . . no falls or injuries to men.

Myers Whaley

Remember, the "Automat" loads, in its stride, any lump of coal that will pass through your tipple, or any lump or rock your cars, aerial tram or larries can take.

"Mechanical Loaders Exclusively for Over 40 Years"

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U.S. Royal Gold Cables

These mine trailing cables have a golden yellow color, for high visibility. They provide new highs in safety —without loss in efficiency.

The jacket is made of tough *pressure-cured* Neoprene —highly resistant to abrasion, cutting, heat, moisture, and oil. Beneath the jacket, a strong cotton braid covers the insulation.

The insulation itself is the finest rubber compound, with a tensile strength as high as 1400 pounds per sq. in. Conductors are of annealed coated copper, the stranding of which is designed specifically for mine trailing cables.

U.S. Royal Gold Cables are approved as tough enough for your roughest jobs only after they have passed seven gruelling "torture" tests. They are approved as flame-resistant by the Pennsylvania Department of Mines.

ALL U. S. ROYAL MINING MACHINE AND LOCOMOTIVE CABLES ARE AVAILABLE IN BLACK OR NEW GOLDEN YELLOW. Write today for free sample to United States Rubber Company, Wire and Cable Department, 1230 Avenue of the Americas, New York 20, N. Y.

APPROVED AS FLAME-RESISTANT

BY THE PENNSYLVANIA DEPARTMENT OF MINES

JOY pioneered mechanization in the coal mines of America . . .

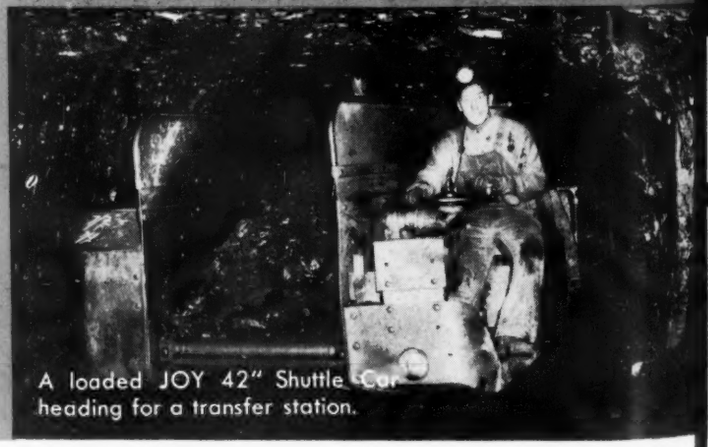
Today, to compete on a tonnage basis, JOY Cutters, Loaders, Shuttle Cars and Conveyors are doubly essential.

JOY 11-RU Universal Cutter, ideal for thin seam operations.

JOY 8-BU Loader, medium height, capacity 1½-3 tons per min.

Licensed under the Patent to E. C. Morgan, No. 1,953,325.

JOY 12-BU loads ¾-1½ tons per min. in seams as low as 30".



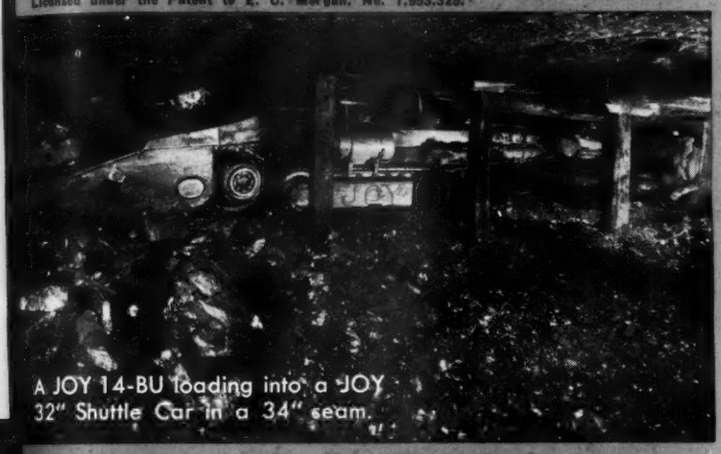
A loaded JOY 42" Shuttle Car heading for a transfer station.

In high coal and low coal, in mines in every section of the country—JOY Mechanized Mining Equipment is outstandingly successful in speeding up rates of production and lowering tonnage costs.

JOY 10-RU Universal Cutter, for medium and thick seams.

6-SC Shuttle Car with elevating discharge, and JOY Belt Conveyor.

Licensed under the Patent to E. C. Morgan, No. 1,953,325.



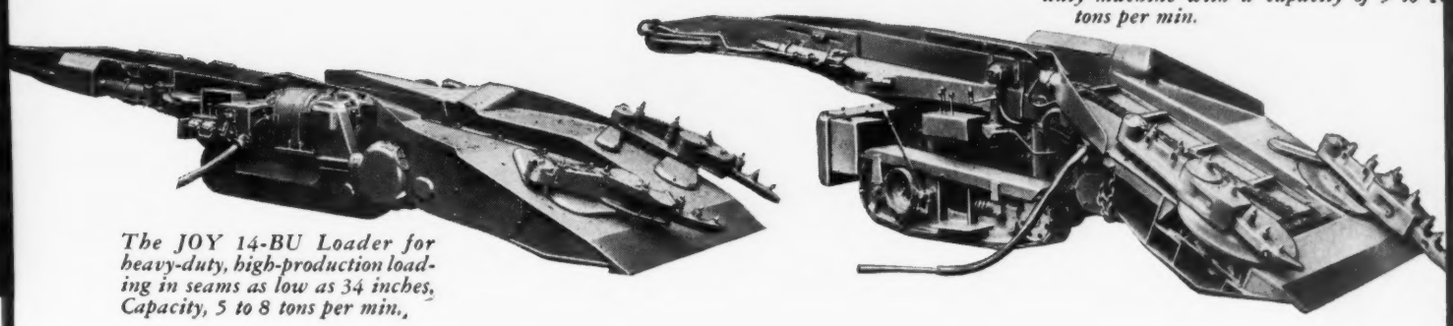
A JOY 14-BU loading into a JOY 32" Shuttle Car in a 34" seam.

JOY 11-B Shortwall Cutter with Bygduster, for conveyor mining.

JOY Shuttle Car loading into a JOY Elevating Conveyor.

A JOY 30" Slope Belt Conveyor with sealed-for-life bearings.

The JOY 11-BU Loader, designed for maximum production in seams 60" or more—a heavy duty machine with a capacity of 5 to 1[0] tons per min.



The JOY 14-BU Loader for heavy-duty, high-production loading in seams as low as 34 inches, Capacity, 5 to 8 tons per min.

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A. The PRIMACORD method . . .

1. Primacord extends the full depth of a hole, contacting every cartridge in the load. Thus, *it initiates the entire charge at maximum power.*
2. Primacord can be hooked up for multiple-hole shots so that *it fires front lines a split-second before succeeding ones.* This permits you to plan for ideal relief of burden and secure better fragmentation.
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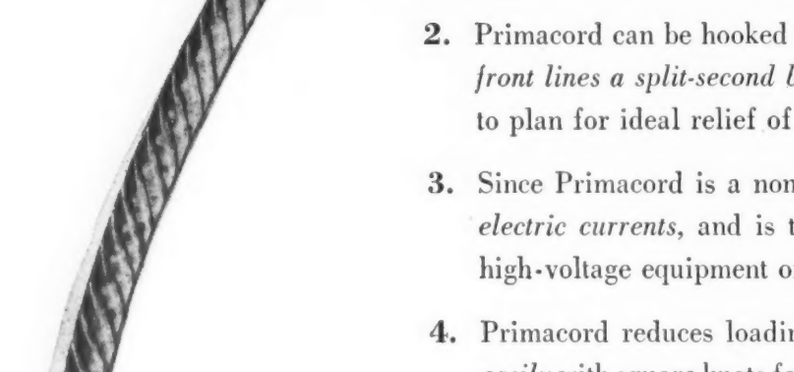
4. Primacord reduces loading time because *it hooks up quickly and easily* with square knots for the main lines and half hitches for down-hole connections.
5. Wound on easy-to-handle spools, *Primacord comes in grades to meet every blasting condition.*



Blasters who use Primacord consistently agree there is no substitute. For more information ask your explosives supplier . . . or write us direct. The Ensign-Bickford Co., Simsbury, Connecticut. P-6

PRIMACORD-BICKFORD Detonating • Fuse •

Also Ensign-Bickford Safety Fuse Since 1836

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

DECEMBER, 1948

IVAN A. GIVEN, EDITOR

Trend and Need

WHETHER "LABORISTIC" rather than "capitalistic" is becoming a more accurate description of the United States economy was a question posed recently by Sumner Slichter, noted economist and writer on labor and other topics. That question—and its implications—becomes even more pertinent as a result of the last election. The door was opened wider by Truman and consequently it can be expected that an attempt will be made to strengthen labor's hand.

In one way, this could work out all right; in another, not. If labor leaders choose to be arbitrary, to drive for more pay for less effort and to try to make the government rather than the individual the sole source of capital and thus the owner of all business enterprises, the results undoubtedly would be the same as in other countries that have swallowed that dose. However, by cooperating with capital and management in the creation of wealth through efficient production, labor could accomplish much in raising the standard of living in the United States. One big job of management therefore remains the intensification of effort toward getting both government and labor on the right road.

Early Need

WITH THE USE of mining and loading machines in growing numbers now imminent rather than merely a possibility, the coal-mining industry could well begin to devote thought to mining systems that will enhance the benefits. If the possibilities in tons per man are only partly realized, coal is in for a revolution in cost and likewise in safety. But one key will remain transportation. Another is continuity of operation. While all present mining and loading machines are designed for room-and-pillar operation—the standard for many years in the United States—operation with such a plan, even with a continuous machine, necessarily involves interruptions and loss of time in shifting the machine and transportation equipment.

Among the proposals for getting more out of the new machines is wider use of semi-longwall plans which inherently reduce the number of necessary interruptions and ease the problem of moving transportation facilities. A new and perhaps more formidable roof-control problem immediately comes to the fore, but with continuous mining and fast extraction its magnitude should decrease accordingly, thereby easing the control problem. Perhaps an overhaul of mining plans has been overdue even with existing equipment. Certainly the new units should be matched by systems that will enable them to produce as they really should.

Shortage Ahead?

IS THE COAL-MINING INDUSTRY going to run into a steel shortage either directly or because it is secondary in nature and therefore not so readily apparent? Continued inability to agree on a voluntary allocation plan for the bituminous industry and increasing reports of difficulties in obtaining steel not only for direct use in mining but for manufacturing mining equipment and the even more important repair parts are, perhaps, signals for more intensive and forthright action. Without steel in adequate volume, coal production of necessity must progressively decline and plans for upping efficiency, raising quality and cutting cost must be postponed. As long as steel remains tight, coal must, in its own interest and for the protection of the consumer, keep a close eye on the situation and be ready to take the necessary action to keep supplies flowing.

World Wide Photo

VICTORY FOR TRUMAN confronts business and the country with questions arising out of a drive for extension of the New Deal and its possible impact on the national economy.

Coal and Washington

Election of Truman and a Democratic Congress Poses the Question of the Effects of an Attempt to Broaden the New Deal—Not Too Much and Not Too Far-Reaching the Probable Answers for the Time Being

NOV. 2, 1948, proved definitely that the bag was Truman's, not Dewey's, and that a plurality of voters in the United States approve the idea of an extension of the New Deal. Next month, a Democratic Congress will be sworn in and the administration may be expected to go into action to get its program on the statute books. Although the election results brought out the pitfalls involved in proceeding on assumptions, it still can be accepted that the Truman program will be more of the same. In fact, it has to be if any attempt at all is made to live up to campaign promises. Therefore, a logical question still is: "How will it affect business and the individual—specifically the coal-mining industry and coal-mining men?"

The answer, again with a bow to the hazards of prediction, is probably less than more. A hard look at past history and future prospects leads, in other words, to the conclusion that some effect can be expected but that the difference will be more in the nature of a mild increase in the difficulties of doing business and making a personal living rather than a wild upheaval.

Employers undoubtedly will encounter additional difficulties in dealing with labor unions and labor leaders. The administration and Congress will look with more coolness on business ownership and management and more favorably on extending government controls over both business and the individual. The cost of financing the Truman program will tend to increase the tax burden, with the administration committed to taking more from the better paid.

Coal's Position

The coal-mining industry, however, is not without experience in most or all these directions. Few if any other industries have had a tougher problem in dealing with unions and the complications growing out of government favoritism, interference and summary action. On the other hand, few if any other industries have had as clear a case for price increases and few if any have done as well in meeting the needs of the consumer and thus avoiding the rationing trap, now very much a threat again.

As far as coal is concerned, therefore, it is difficult to see how the problems of the future can be much greater than those it has had to cope with in the past—at least for the present. In addition, the industry has the benefit of experience and a clear picture of the major situations with which it must deal. It comes up to these situations with the following in its favor: demonstrated ability to meet all demands for coal; a clear record of improvements designed to promote efficiency, quality and service; and a wage scale and employee-benefit program second to none. While, naturally, none of these—or all of them together—afford complete protection against further drives that might seriously prejudice industry position, they substantially decrease the likelihood of more than a nominal increase in difficulties in the foreseeable future. If that is the case, industry's sledding should not be much harder than in the past, particularly if management takes care to play its cards right.

Even if Dewey had been elected, there was no evidence that there would have been any sweeping change in government-business relations, although the prospects were that Dewey would have tried to make it easier for business to get along with government and thus afforded some very welcome relief. But the Dewey Republicans, being the progressive wing of the party, were much more at home talking in New Deal language than the language of the Old Guard. Dewey showed no signs of seating business

at the head of the table and banishing labor to the doghouse and, by inference if not in plain language, indorsed the principles of broader social security, increased minimum wages, public-power projects and other New Deal creations. He was not, however, an active business baiter and would have brought a new competency to government.

Truman has been on record for what he wants for many months. What he will get, however, will depend, in part at least, on Congress. True, the new Congress is Democratic. In addition to the Republican minority, however, many of the Democrats are conservative in leanings and have found themselves at odds with Truman in the past. A number of these conservative Democrats will head important committees and thus will be in position to exert considerable influence, if they care to do so, on possible legislation. The result could be a stalemate on important proposals, with consequent bickering and adverse influence on orderly conduct of government affairs, or it could be a steadying influence that would produce measures better designed to serve the interests of the country as a whole.

The Road Ahead

What actually will happen is, of course, highly speculative and will depend upon the tenacity with which the administration presses its proposals and the temper of the Congress, whether docile and rubber-stamp-like or inclined to take its share of the responsibility for the welfare of the country. What Congress hears from home conceivably could exert a major influence on the thinking of its membership. Ergo, the more sound and reasoned opinion from constituents, the better the chances for sound and reasonable legislation.

Issue by issue, the Truman line, if he attempts to carry out his campaign pledges, will include the following:

1. Repeal of the Taft-Hartley Act. Chances good for at least substantial modification favoring labor leaders.
2. Acceptance of the labor viewpoint to a much greater extent in the conduct of government affairs.
3. A higher minimum wage and tacit, if not active, encouragement of demands for further wage boosts.
4. Higher support prices for farm products.
5. Government action to hold down consumer prices—a key campaign point and one probably involving subsidies as a means of achieving reductions or avoiding increases.
6. A drive for at least standby rationing powers to supplement any price-control action that may be taken; certainly a drive for power to allocate scarce or tight materials, such as steel.
7. Broader social security and bigger benefits, reinforced by a comprehensive health and welfare program.
8. A hard drive for a civil-rights program, with the possibility of another real scrap in Congress.
9. A major expansion in federal construction of housing, hydropower development and river-valley authorities.
10. More federal action in the fuel field, with greater emphasis on conservation and regulation of production; probable strengthening of the synthetic-liquid-fuels program.
11. More firmness and certainty in foreign policy despite possible doubts as to the methods that may be employed, and additional spending to influence and strengthen possible allies against failure to achieve a basis for a lasting peace; aid to China a question mark.
12. Probably higher taxes or a return to borrowing to finance the added costs of the preceding and other items in the Truman program; certainly little prospect of any further reduction and not too much hope of a revision in the tax structure that would ease business and individual burdens. The emphasis, in fact, will be on soaking "the interests" and any individual in the "better price" class.

Program Formidable

If war becomes imminent or actually breaks out, there will be little question about adoption of severe controls over the economy. In fact, they will be essential. For imposition on a peacetime economy, however, the Truman program is indeed formidable in nature and probable effects, the latter including the adoption of controls over individual action never before tolerated in a non-war period in the United States. It may be too formidable for even a Democratic Congress to swallow in its entirety and in one gulp—in fact, quite likely so—although there is little question that certain parts will be adopted early in the next session and about as presented.

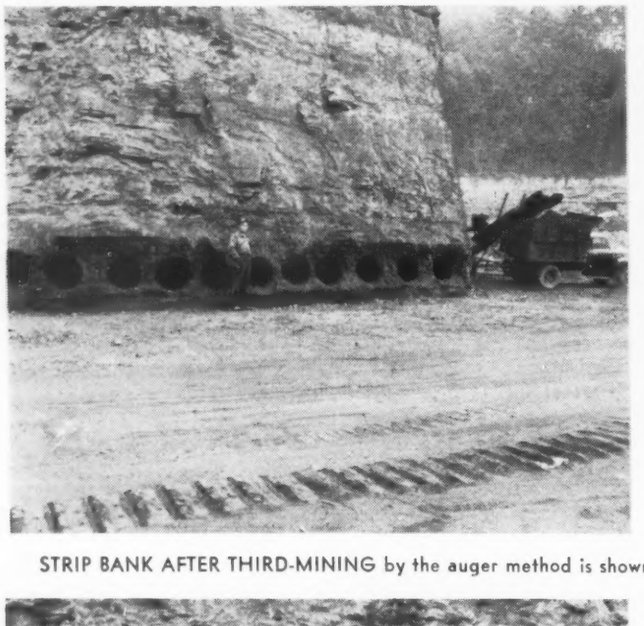
Even if Truman throws everything at Congress next month, the chances logically are good for some watering down, some compromise, some deferment and—possibly—some elimination, if for no other reason because there always is in acting on any broad program. Underlying everything, in addition, is the continuing heavy demand for goods and services for use both at home and abroad that requires keeping the industrial and business machine going at top speed and may therefore persuade Congress and perhaps even the administration that it would be best to proceed cautiously—at least on some things.

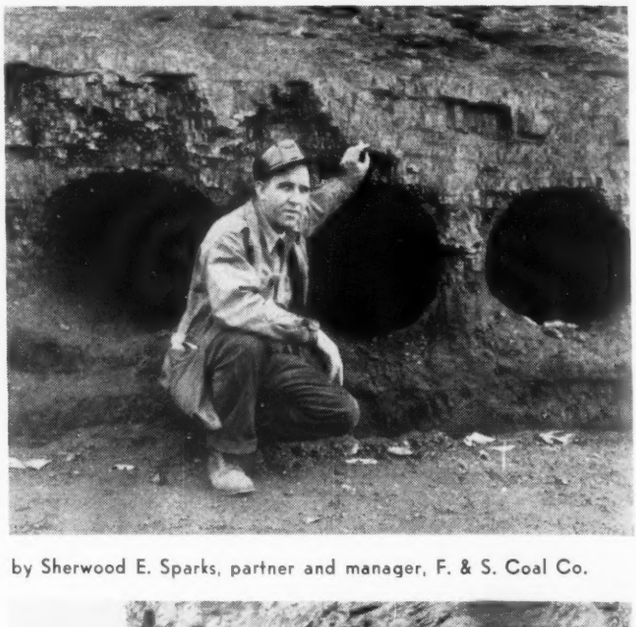
Policy for Coal

However other industry may fare, coal, as already set forth, already has been through the mill and should not find the future much more difficult than the immediate past. At the same time, it can continue to look forward to a high level of demand. But it also is a favorite target of a fair number of people and therefore must keep its guard up—even more so now that the New Deal has been given a new lease on life. Its future policy therefore might well include the following:

1. Working more closely with members of Congress.
2. Emphasis on achieving a method of dealing with the miners' union on a more friendly and constructive basis, thus making it unnecessary for government to intervene and preventing interruptions to production.
3. Speeding up the installation of modern equipment to keep down cost and insure an ample supply of fuel at the lowest possible cost, thus outselling other fuels in the competitive market and promoting conservation of oil and natural gas.
4. Providing adequate mining capacity to meet increasing fuel needs and insure the necessary capacity for possible defense needs.
5. Stepping up research in better coal utilization and in the development of a commercial-scale synthetic-fuels industry.
6. Improving service to the fuel user.
7. Keeping the government and the public informed, through skillful public relations, about the industry's problems and needs, its progress in mining, preparation and promotion of employee welfare, and its ability to meet any demands that may be thrust upon it, with emphasis on working with members of Congress.

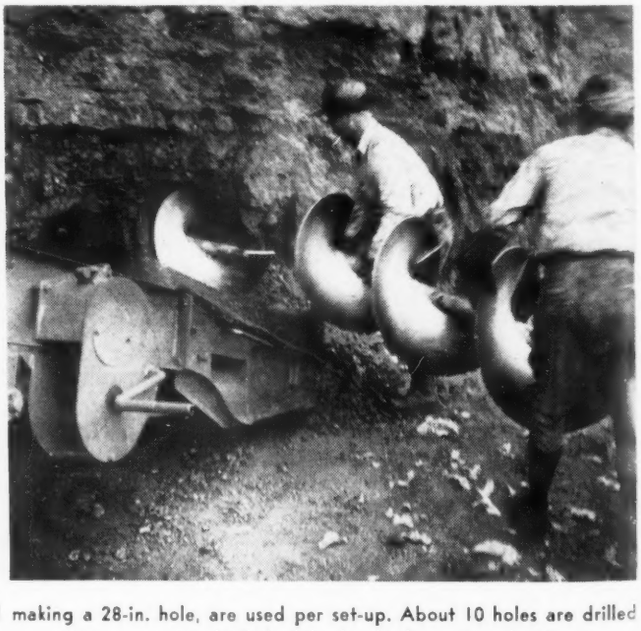
Large Drill Successfully Produces From Twice-Mined Section as . . .





STRIP BANK AFTER THIRD-MINING by the auger method is shown by Sherwood E. Sparks, partner and manager, F. & S. Coal Co.

AUGER-MINING SET-UP (left) includes an elevating conveyor discharging into a truck and requires only three machine men and a truck driver. The drill rig is moved to a new position by barring it over on greased skids (right).



SEVEN OF THESE 24-IN. DRILL SECTIONS (left), each 6 ft. long and making a 28-in. hole, are used per set-up. About 10 holes are drilled a shift, each full 42-ft. hole producing 6.8 tons of coal. Two men change a section (right) while the third operates the rig.

Auger Mining Ups Coal Recovery

Border Coal Left in Deep and Strip Operation Recovered With 24-In. Augers—60 Tons per Day Mined and Delivered to Ramp by Four-Man Crew—Ash Content Lower Than by Underground Methods—Larger Unit Planned

USING A 24-IN. AUGER, the F. & S. Coal Co. is now third-mining a finger-shaped area of coal at the Lynco mine, Lynco, W. Va., previously worked by deep mining and stripping. With the auger, a four-man crew was producing 60 tons of coal with an ash content of less than 3 percent and delivering it one mile to the railroad ramp, in spite of the fact that they had had only 11 days of experience at the time the material was gathered for this description of the process.

Underground mining was completed in the area by the Crozer Coal & Land Co. three years ago. The second mining was conventional outcrop stripping by the F. & S. organization. Completion of that stripping to the 45- to 50-ft. maximum depth practicable with the equipment on the job left a 40- to 50-ft. border of coal between the highwall and the worked-out rooms. Third mining by the new auger method is recovering a considerable percentage of this border coal.

Cuttings Deposited on Conveyor

The coal is bored out with a 24-in. auger which deposits the cuttings on an elevating conveyor discharging to a motor truck. The horizontal drill is a McCarthy unit made by the Salem Tool Co. and is powered by a 32-hp. air-cooled V-4 Wisconsin gasoline engine. The auger, also made by Salem, consists of seven 6-ft. sections. The spirals are made of ⅜-in. steel plate and are hard surfaced on the edges. The cutter head, which includes a pilot cutter extending 12 in. ahead of the main arms, uses the same renewable tipped bits as are standard for overburden drilling.

Three men constitute the machine crew and the fourth man drives the two trucks which do the hauling. One truck is left under the elevator to receive the auger cuttings while the other is driven to the railroad ramp.

Except for spotting the truck as the loading progresses, the crew of three have little to do beyond adding auger sections and moving the machine and elevator. Pinch bars are used to slide the drill along two sawed timbers that are greased on top. A move usually takes about 12 min. At the end of the shift, rubber-tired wheels on stub axles are affixed to the machine frame, the jacks are retracted and the unit is pulled back away from the highwall for idle-shift storage.

To add a 6-ft. section of auger one man operates the machine to retract the boring bar, while the other two roll the auger section to approximate position and then lift it for engagement of the sockets and insertion of the spring-locked socket pins.

Holes Drilled 42 Ft. Deep

Approximately 35 minutes is required to drill a 42-ft.-deep hole producing 6.8 tons of coal. The average is 10 holes per shift and if none penetrate the old works the production is 68 tons. As a result of wobble, the 24-in. bit and auger make a 28-in. hole.

The seam is the Campbell Creek or No. 2 Gas, which at Lynco ranges close to the 50-in. mean thickness and is 53 in. where the auger mining illustrations were made. The seam is without impurity lenses or partings of any character. Therefore, the auger-produced coal contains only the inherent ash. G. E. Minns, assistant general manager, Crozer Coal & Land Co., states that the ash in railroad cars of the auger-mined coal has run as low as 2.6 percent, while conventional underground mining in the same locality with hand-picking preparation produces coal with an ash content of 4 to 5 percent. The Logan & Kanawha Coal Co. is the sales agent for the auger-mined product, which classes as 1¼-in. nut-and-slack.

Sherwood E. Sparks, manager of the F. & S. Coal Co., and a partner with Sidney Ferrell, Logan, W. Va., requested the Salem Tool Co. to build the 24-in. auger and drill rig after checking experimental use of 9- to 20-in. augers in Nicholas County, West Virginia, to mine clean coal from between bands of impurities. That work was done at the suggestion of M. M. Lilly, Jr., du Pont technical service representative, Charleston, W. Va., under the direction of R. M. McMillan, superintendent, Becker County Sand & Gravel Co., Summersville, W. Va.

Drill Makes 28-In. Hole

When Mr. Sparks ordered the 24-in. outfit he assumed it would bore only a 24-in. hole. Therefore, he intended to stagger the holes at two elevations to get a fairly large percentage of the seam. The drill, because of wobble, makes a 28-in. hole. Consequently, staggering in the 53-in. seam is not practical.

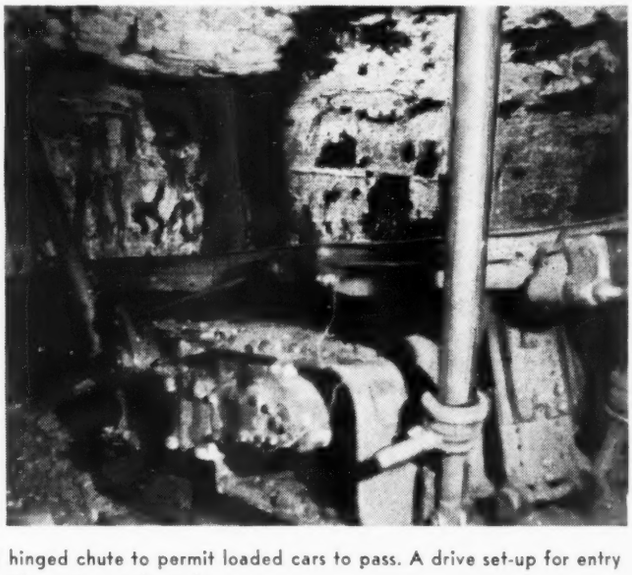
Success with the 24-in. auger has led Mr. Sparks to place an order for a 36-in. rig. It is expected that with this larger unit it will first be necessary to drill a smaller pilot hole to the full depth. The Hardsocg division of the Cardox Corp. is building the larger unit.

Learning to aim the 24-in. auger so that it will not hit the roof or bottom did not take long in the 53-in. seam. The first hole hit the top and the second the bottom. All succeeding holes stayed in the clear. A number of holes, however, have run together. Where this has happened, drilling has been discontinued to avoid breaking the auger. With the unit now in use, no correction can be effected when a hole goes wrong. An advantage of a 28-in. hole over smaller sizes is that a man can crawl into it to recover a broken or uncoupled auger.

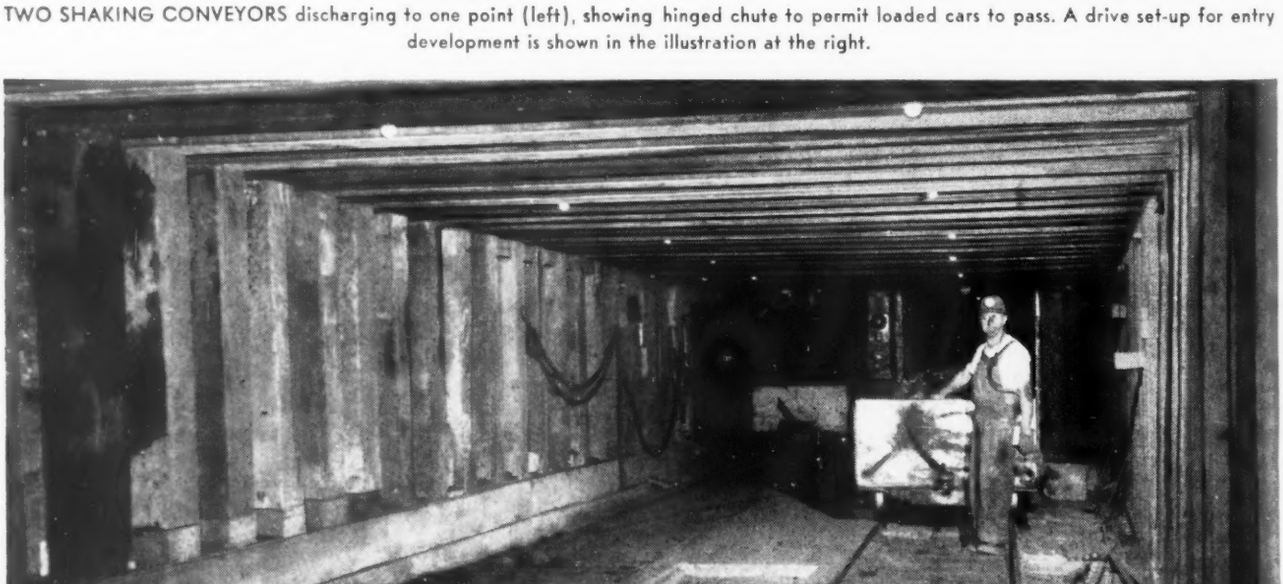
The coal seam is fairly level and although local rolls are encountered they are not bad enough to interfere with auger mining. Spacing of the holes becomes a problem when rounding a point. Keeping the holes parallel results in a cramp at the corner on the one hand, while drilling along the radii would result in wide spacing at the entrances and loss of coal. It will take experience to determine a compromise hole layout for sharp turns in the highwall.

Systematic Timbering and Planning Handle Roof Problems at Imperial Coal

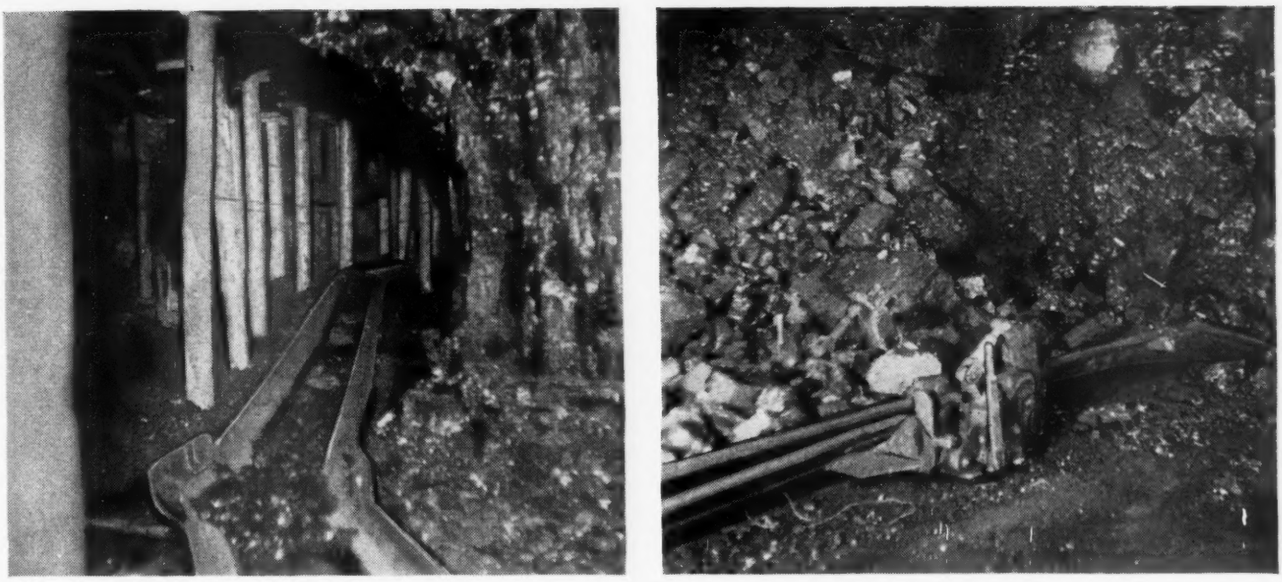
TENDER TOP NECESSITATES CAREFUL TIMBERING. Typical room timbering on 4-ft. centers is shown at the left. Timbers are kept within 4 ft. of the face, as shown in the pillar place at the right.



TWO SHAKING CONVEYORS discharging to one point (left), showing hinged chute to permit loaded cars to pass. A drive set-up for entry development is shown in the illustration at the right.



SHAFT-BOTTOM RETIMBERING included rail crossbars, treated-timber legs on concrete footings, solid lagging and a plank floor in front of the landing designed for both neatness and safety.



ROOM-AND-PILLAR WORK AT EAGLE. At the left is a typical pan-line set-up in pillar mining, showing use of double swivels to make the turn; right is a duckbill moving coal in room operation.

Shaker Mining Under Tender Top

Eagle Mining Plan Assures High Extraction Despite Weak Top—Careful Timbering and Limiting Number of Working Places per Panel the Keys—With Duckbill Loading, Four Men Average 80 Tons per Shift in Rooms

A 92-PERCENT EXTRACTION with duckbills, in spite of a very tender top, has been achieved under methods worked out at the Eagle mine of the Imperial Coal Co., three miles east of Erie, Weld County, Colo. A shaft operation, the mine originally was opened by the National Fuel Co. The shaft, 369 ft. deep, was completed June, 1939, after 80 three-shift sinking days. The Imperial Coal Co. purchased the mine on Nov. 1, 1947.

Production at Eagle is from the lignite formation of the Denver basin, excellent in grade and analyzing approximately 9,900 B.t.u. with a moisture of approximately 22 percent. The preparation plant, including seven truck and four railroad-loading stations, with five storage tracks capable of holding 65 cars, is equipped to prepare the following grades: ¾-in. dust, 1½-in. slack, 2½-in. slack, 1½x¾ modified pea-stoker, 2½x1½ pea, 8x2½ egg or nut and 8-in. lump.

Approximately 20 percent of the output is trucked to neighboring communities, including Denver, and, in addition to a Union Pacific R.R. connection, the mine is served by two hard-surfaced roads: Highway 240, passing directly by the mine entrance, and Washington Road (Colorado 185), a quarter of a mile to the east. Company and mine officials include James Brennan, president; George Brennan, vice president; Frank Kolar, general superintendent; Wilbur Metz, general mine foreman; Martin G. Vancil, top foreman; and Wilbur J. Gunther, purchasing agent.

Average thickness of the coal seam at Eagle mine is 9 ft. It pitches 1½ percent northeast and is free of impurities. The bottom is soapstone and the top is 5 to 12 ft. of black slate. In general, the roof is extremely tender. The slate is thinly laminated and swells badly when exposed to air. This necessitates leaving 12 to 14 in. of top coal to prevent moisture absorption.

Operation is characterized by a steady winter run with a heavy demand for lump. In the summer months the demand is for industrial sizes of coal and is relatively slim. Therefore, the practice is to concentrate on mine repairs and development work in the summer season. Among other work last summer, the shaft bottom was completely retimbered with 120-lb. rail crossbars on treated legs resting on concrete footers. The top was lagged solidly and the bottom was floored with wood in front of the landing for neatness and safety.

During the winter season the mine employs 90 underground and 18 surface men on two operating shifts and produces an average of 1,050 tons of cleaned coal per day. Underground machinery includes 14 shaker conveyors with duckbill loading heads, 14 shortwall cutting machines, eight gathering and haulage locomotives and 2-ton steel mine cars equipped with roller bearings. Hand-held electric drills are used exclusively.

The mining system is room-and-pillar with 92 percent extraction. The mine is laid out with one set of main entries running north, one running south and one running west. The room entries run east and west and all rooms are driven due north. For production purposes, the mine is blocked out in panels varying in size with the local conditions encountered. As a result of the relatively heavy cover and the tenderness of the slate top, it has been determined by experiment that a room depth of 200 ft. is the practicable maximum. When this depth is not exceeded, the room usually can be driven out and its

Panel and Room Plans for Full-Retreat Mining at Eagle Mine

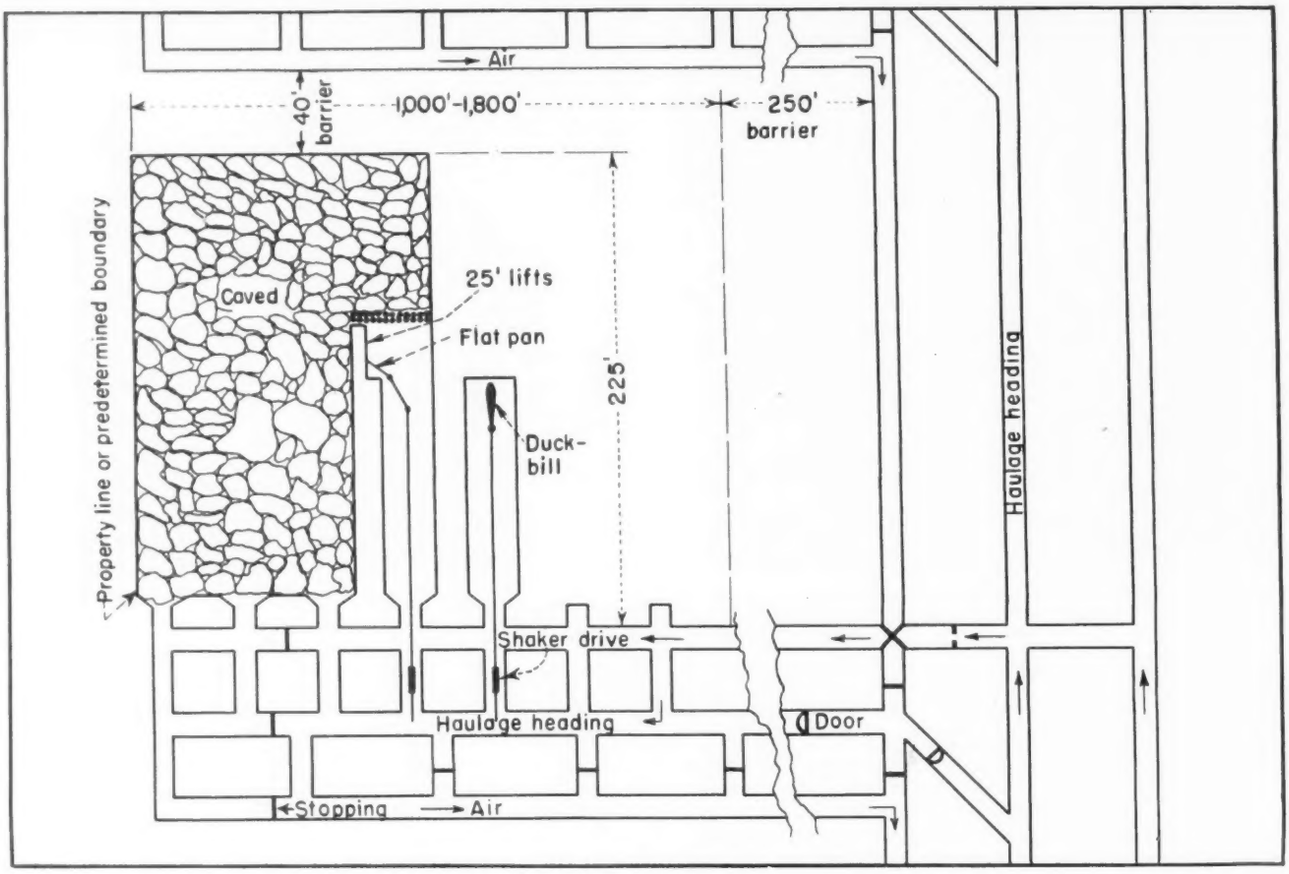


FIG. 1—EAGLE PANEL PLAN showing retreat mining of rooms and pillars.

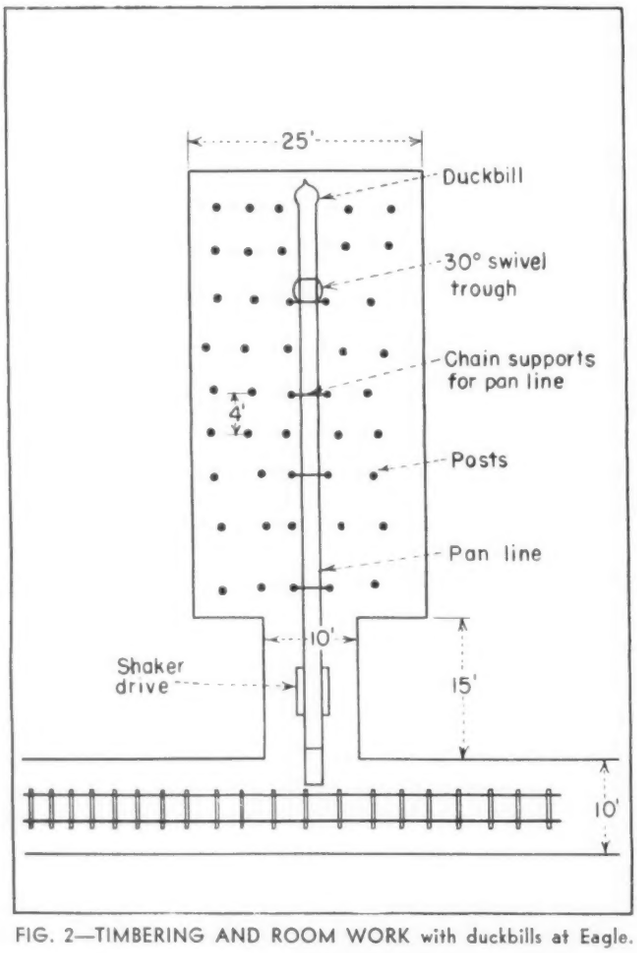


FIG. 2—TIMBERING AND ROOM WORK with duckbills at Eagle.

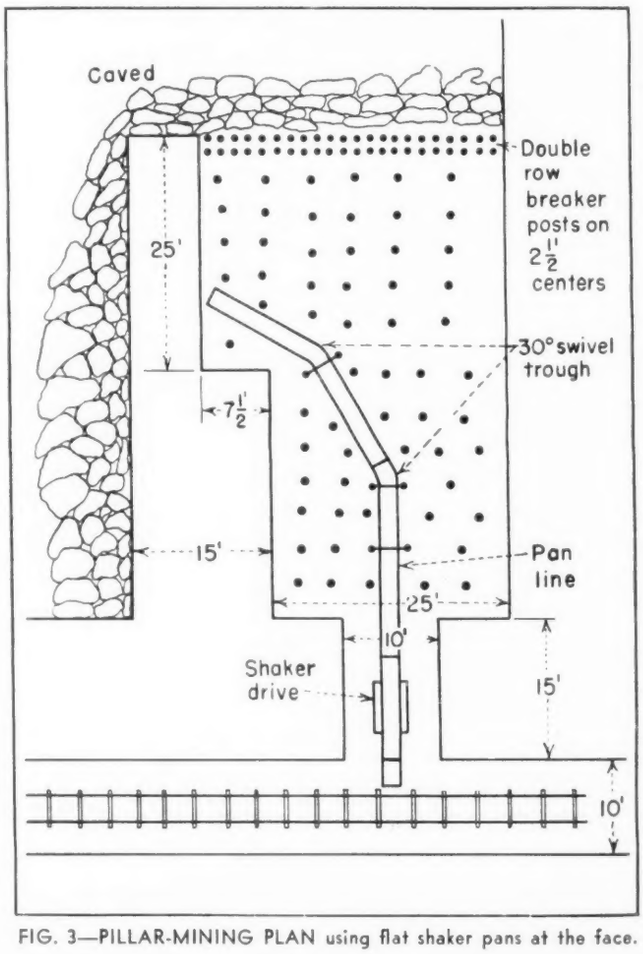


FIG. 3—PILLAR-MINING PLAN using flat shaker pans at the face.

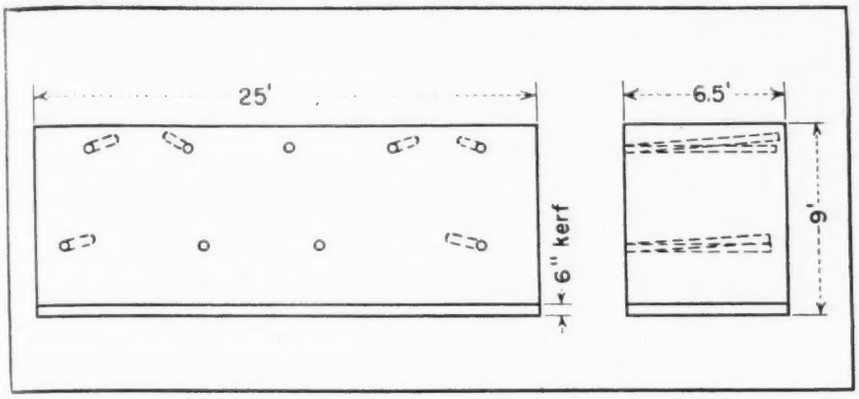


FIG. 4—DRILLING PATTERN for room work at Eagle mine.

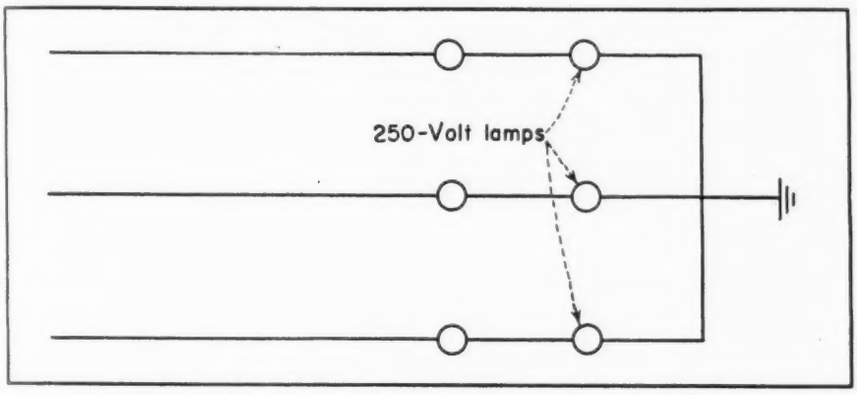


FIG. 5—GROUND INDICATOR hook-up for 440-volt a.c. service.

adjacent pillar extracted with little retimbering in the room area. The additional time required to drive deeper rooms results in a considerable expense for extra timbering. Rooms are turned north on 40-ft. centers and are driven 25 ft. wide, thus leaving a 15-ft. pillar between.

Fig. 1 shows the usual panel working plan. Three headings are driven to a predetermined boundary. Three cuts are taken out of each room-neck as the headings are advanced. When entry driving is completed, room-and-pillar extraction is started, the first room being driven along the boundary line. Only two shaker units are employed in each panel, one driving up a room and the other extracting the adjacent room pillar. Thus there is never more than one pillar being mined.

This system of full retreat mining is responsible for the 92-percent extraction of all coal in the panel area. A major factor in achieving this extraction is that no more than one room is opened up at a time in the panel. The top is so tender that if two or more adjacent rooms were opened up together, the places could not be kept open long enough to recover the intervening pillars. The coal structure is not very solid and the pillars would squeeze out before they could be economically mined.

Room work is performed in accordance with a standard cycle of operation: The shortwall is sumped in along the right rib and cuts about halfway across the face. As soon as the right half of the face is undercut the driller starts to work and the right half of the face is shot down. The duckbill then moves in to start loading. While the right half is being loaded out, the machine finishes its cut across the face and the left side is drilled and shot down. By the time the cutting machine has been pulled back from the face enough coal has been loaded out to enable it to be sumped in again on the right side.

With this cycle of operation, an average of two full cuts per shift are mined. Each cut averages 40 tons. The total crew per room is three facemen and one loaderhead man. The room timbering, as shown in Fig. 2, consists of five posts across the room, with the rows on 4-ft. centers, plus sufficient extra posting at the face to insure safe working conditions. Props are never more than 4 ft. from the face and are removed one at a time to permit the duckbill to be swung. Since crossbars with two legs will not hold the dead weight of the roof, this posting and resetting of timber is the only safe practice that has been developed.

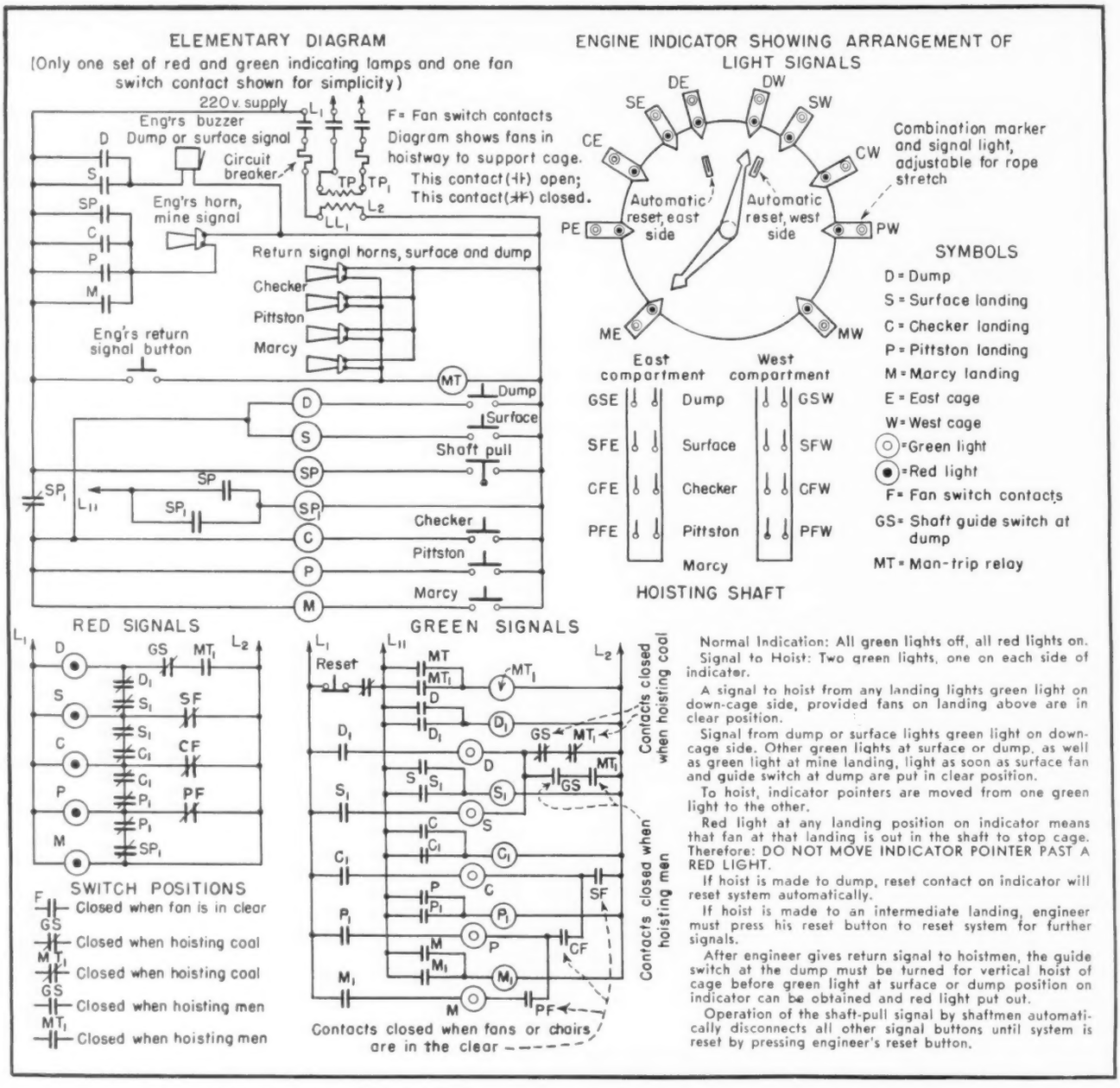
The trough line of the conveyor unit is chain suspended from the timbering. The duckbill is not used in pillar work. Instead, the facemen hand-load onto the shaker pan line. Two 30-deg. swivel troughs are used in pillar work to permit swinging the pan line into the working place. The 15-ft. pillar is extracted by taking successive lifts 25 ft. long across the end. A double row of breaker props is placed, as in Fig. 3, to control the top for proper caving.

In pillar work the same crew of four men averages one cut per day. This reduction in tonnage reflects added timbering and hand loading. The rooms are driven without crosscuts, using auxiliary blower fans for ventilation. Consequently, pans must be removed to the room entry when the pillar is pulled back. The shortwall cuts the full 25 ft. in pillar work before the coal is shot down.

Standard shooting practice in rooms involves nine holes drilled as shown in Fig. 4, five at the top and four in the center. When lump demand is strong, the coal is broken down with Cardox. If the demand is for the smaller industrial coal, three sticks of permissible powder are loaded per hole.

The top caves quite readily with the removal of the breaker posts and room timbering, thus insuring good roof control and keeping the weight off the pillars. Timber recovery runs from 50 to 90 percent. All haulageways and working places are on intake air supplied by a 110,000-c.f.m. fan.

Electric power is purchased from the Public Service Co. of Colorado at 13,000 volts, 3-phase, 60-cycle. The incoming power is transformed on the surface to 440 volts. Cutting machines and shaker drives operate on the 440-volt a.c. Each cutting machine is equipped with an internally mounted transformer with an outside receptacle to provide 110 volts for operating the hand-held electric drills. The 250-volt d.c. power for trolley locomotives is obtained from two 75-kw. motor-generator sets on the surface operating in parallel. The electric hoist is powered by a 250-hp. 440-volt 435 r.p.m. induction motor. Facilities in the electric shop include a short-circuit indicator consisting of two 250-volt lamps in each 440-volt line to ground (Fig. 5). Any short circuit will extinguish two of the lamps and the shorted line can be traced.



THE IMPORTANCE OF INTERLOCKING is apparent in this elementary diagram of the signal system.

Safer Signaling for Shafts

Revised Signal System Applicable to Shafts Serving Several Levels—Red and Green Lamps Provide Hoisting Engineer with Visible Signals—Interlocking of Signal Circuits Eliminates Confusion and Costly Mistakes in Operation

By E. B. WAGNER
Electrical Engineer (Ret.), Lehigh Valley Coal Co.
Wilkes-Barre, Pa.

INDICATOR SIGNALS using stop and go lights on the hoist engineer's dial make for safer operation of cages between the dump and/or surface landing and three underground levels at the Marcy shaft, Exeter colliery, The Lehigh Valley Coal Co., Wilkes-Barre, Pa. Interlocking the circuits from the various shaft signal stations has eliminated the "human element" that might lead to hoisting errors. Now, all the engineer must remember when moving the cages from one green-light station on the dial to the next is that he must never pass a red light.

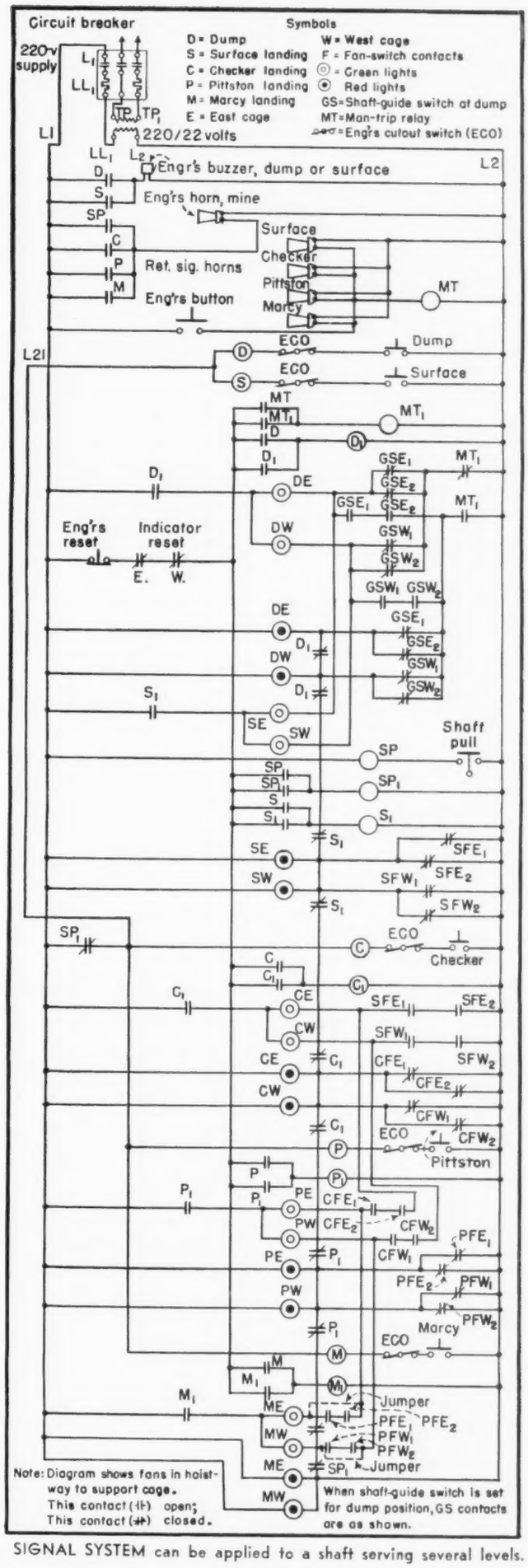
An earlier version of this hoist signal system (May, 1940, *Coal Age*) has been working satisfactorily for the past eight years at a shaft having a surface landing, an intermediate level and a bottom landing. However, a further application of the first signal system

to other shafts having more intermediate landings, and using self-dumping cages, showed that some revisions in the original circuit connections were necessary. For example, a set of cutout switches was placed on the engineer's platform to prevent an unexpected signal from being given at a landing other than the one from which coal is being hoisted.

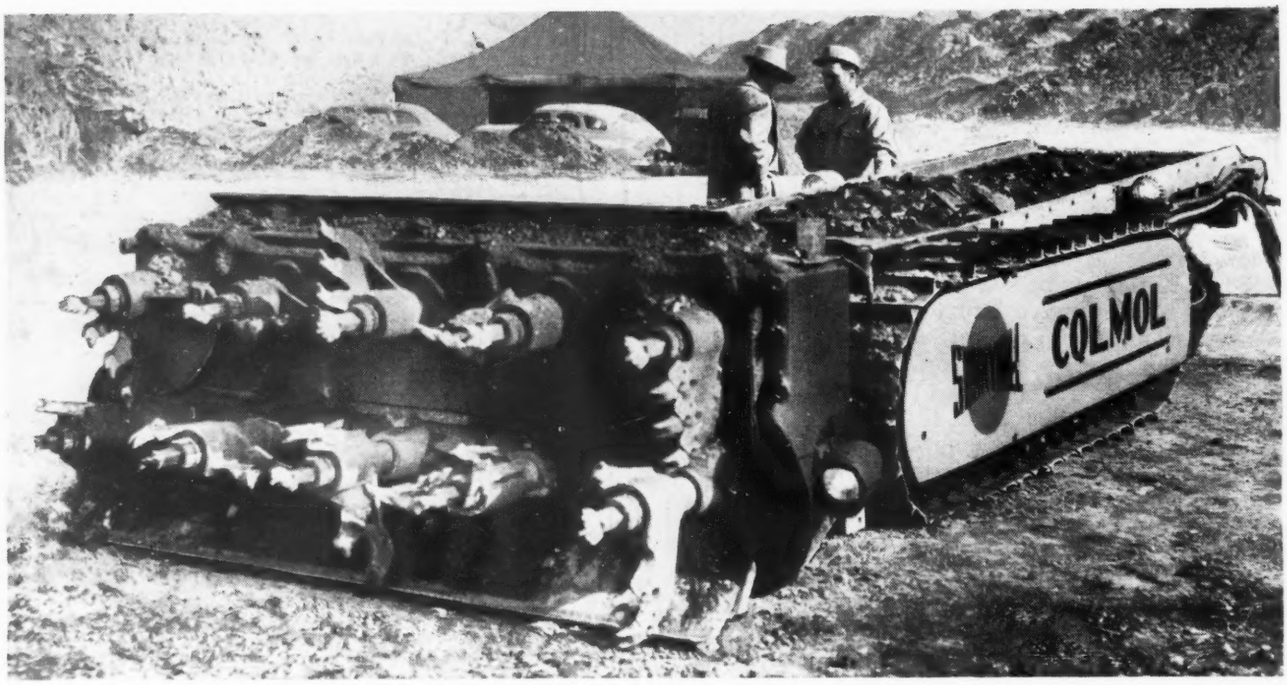
When self-dumping cages are used and men are hoisted to the same landing from which the cages dump, a switch is inserted in the shaft guides so that the cage can either be switched into the dumping position when hoisting coal, or to the vertical run when men are riding. With the new signal layout, the green light at the dump position on the indicator dial is governed by two conditions: (1) when hoisting coal the shaft guide switch is set to tilt the cage towards the dump and the green lamp should light when the signal button at the dump is pushed; (2) when hoisting men, the guide switch is set for the vertical run and the green light should again light when the signal button at the dump is depressed. For safety reasons it should be impossible for the shaft headman to light the green lamp at his station (surface) on the hoist indicator dial, unless he has first placed the shaft guide switch in position for vertical movement of the cage in hoisting men.

The lighting of the green signal lamp from the same signal button, under two different conditions, is accomplished through Relays MT and MT-1 (see illustrations) and a double-pole double-throw switch, GS, connected by linkage to the shaft-guide switch. Relay MT is actuated through the engineer's return-signal button, which he pushes when acknowledging the signal for hoisting men. When Relay MT is energized it changes the connections to the green signal lamp for the dump position through Relay MT-1. Therefore, it is necessary for the shaft headman to place the shaft-guide switch in the position for a vertical hoist for his signal button to be connected again to the green signal light. Hence, when this signal lamp is lighted, after the permissive signal is given to make a man-hoist, the engineer has a positive indication that the switches for the shaft guides have been set so that the mantrip can be made safely.

To sum up, this signal system, as revised, accomplishes the following results: (1) concentrates all the signals necessary for safe operation of the hoist at one point—the indicator dial; (2) gives the hoisting engineer positive identification of the point from which the signal originated; (3) prevents unexpected signals being given from landings other than those from which coal is being hoisted; (4) shows the engineer between which landings the hoist should be moved and maintains this information until the movement of the hoist is practically completed, thus materially reducing the chances of an overhoist; (5) simplifies the hoist-signals to two basic rules: Green (Go); Red (Stop); (6) makes it obligatory, when self-dumping cages are used, for the shaft headman to arrange the guides for a vertical hoist, when a man-hoist is made, before the Green, or Go, signal is given; (7) protects shaft repairmen from injury by an unexpected movement of the cage, as operation of the shaft pull rope by them automatically disconnects all other signal buttons; (8) the red signal light remains on at any landing where the shaft fans or chairs are out in the shaft where they will interfere with the movement of the cage. The red light reminds the engineer that the cage should not be moved past this point.



SIGNAL SYSTEM can be applied to a shaft serving several levels.



EMPLOYING THE BORING PRINCIPLE, the new continuous mining machine will be made available in several models for operation in seams of varying thicknesses. Output of 500 to 1,000 or more tons per machine-day with a four-man crew is anticipated by the builders.

New Unit Mines Continuously

Operating in Mole Fashion and Eliminating Cutting, Drilling and Shooting, New Continuous Machine Is Offered for High Production Out of the Solid—Boring Principle Utilized Through "Chipping Heads"

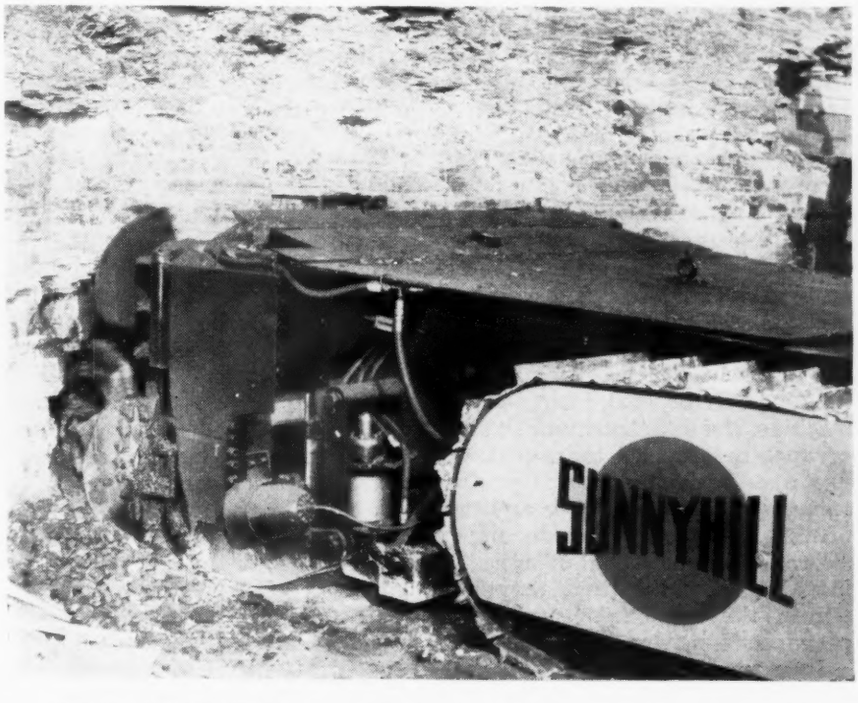
DESIGNED TO DO ITS OWN MINING without cutting, drilling and shooting, the new "Colmol" continuous mining machine was unveiled by the Sunnyhill Coal Co., Pittsburgh, Pa., in a demonstration at New Lexington, Ohio, Oct. 27. The new machine, presently driving

COAL FACE LEFT BY THE MACHINE in the No. 6 Upper Kittanning seam at New Lexington, Ohio.

BUSINESS END OF THE CONTINUOUS MINING MACHINE. The "chipping heads" that do the actual mining are supplemented by top and bottom shearing blades.

a room approximately 9½ ft. wide and 4 ft. high, advances the face, according to the builders, at a rate of 18 to 36 in. per minute and is expected to result in output of more than 100 tons per man-shift. New highs in concentration of production and supervision are forecast, and production is expected to reach more than 500 to 1,000 tons per machine per day with crews of as low as four men and continuous transportation. Various models—probably three or four—will be produced, it was announced, for various seam heights. "A production of 3 to 5 tons per minute is a definite possibility," with more still in thicker seams, the designers state.

Mining of the coal out of the solid is done by ten rotating "chipping heads" in two rows of five each. Each head consists of a pilot bit supplemented by widely spaced teeth, each tooth being set or stepped back in succession to the outside of the head. The circular kerfs made by the heads overlap, and as the machine moves forward the effect is to break the coal ahead of the teeth into the free spaces previously provided by the pilot bit or the leading teeth, minimizing the production of fines, promoting coarse-coal output and permitting high production with relatively little power. The teeth are connected by rearwardly sweeping sharpened edges that remove any coal not previously broken out.



THE "CHIPPING HEADS" cut beyond machine limits to permit its free movement.

Machine Cleans Face

The rotary chipping heads also function as paddle conveyors to sweep the bottom and, with the assistance of a floor-shearing blade, move the coal from the face onto the conveyor for discharge at the rear of the machine to a conveyor system or other transport unit. A second shearing blade on the top of the machine removes the ridges left by the upper chipping heads. Floor and roof are left uniform and, Sunnyhill officials state, less than 1 percent of the coal is left in the corners of the rooms.

The basic principles involved in the development of the new machine are summarized by its designers as follows:

"1. The cooperative action of the various chipping heads (arms) fractures the coal at the cleavage points and ahead of the bits. Thus, the coal is not milled out by actual contact of the bits with each particle, as is the case with the undercutting machine. Rather, it is chipped out by cooperative fragmentation. Very little power is required.

"2. The heads (arms) represent a revolutionary modification of the boring principle, in that no part of any of the heads needs contact the perimeter of the passageway cut by the machine. The Colmol, therefore, may freely move into and out of the passageway it has cut."

Co-inventors of the Colmol are C. H. Snyder, president, Sunnyhill Coal Co.; A. E. Lamm, executive vice president; the late David M. Spratt; and V. J. McCarthy, Youngstown, Ohio. Development started several years ago, with an approach derived from observation of horizontal drilling in stripping. This was followed by experimentation with a large-diameter auger on a horizontal drill, out of which grew the first experimental Colmol. This unit, utilizing army tank parts, was built at a former Sunnyhill warehouse near Imperial, Pa.

Hard-Structure Bituminous Coals Successfully Recovered

WHAT THE MACHINE TURNS OUT—left, No. 6 Upper Kittanning coal at New Lexington, Ohio; right, Pittsburgh coal, Imperial, Pa.

While the usual difficulties were encountered, the first machine was made to work and produce at a rate of 5 tons per minute. The findings were utilized in the construction of the present, or second experimental, unit which, "with only slight alterations, may be typical of a standard production model." Production plans had not been formulated at the time of the demonstration, but officials state that the machine "will be made available to all mining companies and at an early date."

The Oct. 27 demonstration was held at the Sunnyhill strip mine, with the machine operating in hard-structure No. 6 Upper Kittanning coal containing numerous large sulphur balls, a 6-in. hard slate band and bone coal and hard binders. Previous tests included the hardest-structure Pittsburgh coal in Allegheny County, Pennsylvania, and soft-structure Upper Freeport coal in Preston County, West Virginia. In view of these tests, Sunnyhill men are of the opinion that the machine "should operate successfully in the entire range of bituminous coals from those of a soft, friable nature to and including those of the hardest structure. It has been operated successfully in shale and may prove invaluable in tunnel work."

While various mining plans have been considered, the Sunnyhill organization stated that the best way of using the Colmol was still being studied. In initial tests in the conventional room-and-pillar system rooms were successfully driven at an angle of 60 deg. from entries widened at the room necks. The unit, it was stated, will lend itself to longwall mining where roof conditions permit. It also has been suggested that rooms be eliminated and a series of places driven to put all mining parallel to the original entry. "Production with the Colmol under widely varying conditions may well result in new mining plans, and novel and speedy methods of timbering doubtless will be developed."

Among the major Colmol contributions to the art of mining stressed by the designers is greater safety at the face. Its speed of advance and the resulting decrease in the time a place must be kept open, together with the elimination of shooting, is expected to reduce roof troubles materially. Operating vibration is so little, it is stated, that many roofs now requiring considerable timbering will require none, while mining can be carried on with reasonable safety under roof that would be absolutely unsafe with conventional mining methods.

Controls are located at the rear of the machine so that the operator customarily stands 25 ft. back from the face. The unit is so constructed, the builders point out, that a 20- or 30-ton roof fall will cause no damage and can be loaded out by the machine itself. Automatic water sprays are provided to keep down dust and the chipping heads cut far enough out from the sides and top of the machine to provide ample clearance for movement. The heads may be stopped so that they are within the machine clearance to permit such movement.

It has been found advantageous, the designers state, to position the lower row of chipping heads in advance of the upper. This, together with the overlapping clearance produced by vertical lateral adjacent heads, permits the coal to be dislodged ahead of the cutting teeth, increasing the yield of coarse sizes.

The chipping heads are mounted in separable upper and lower rows. The rows may be raised or lowered together or spread apart vertically to compensate for changes in seam conditions.

The Sunnyhill Colmol is described as a completely mobile unit operating on crawler tracks, permitting turning the machine in a radius materially shorter than its length, "thus reducing the problems of maneuvering in closely confined passages."

Bits used in the chipping heads feature a spring retainer that permits replacement of the entire set by one man in four minutes or less. In ordinary coal, it is stated, the bits will produce 1,000 tons or more per set.

Hydraulic drives power the rotary chipping heads, the crawler tracks and the conveyor. Extensive use also is made of hydraulic controls for positioning the chipping-head assembly and the tail end of the conveyor, and for regulating the tracks, each of which is independent of the other and each powered by two hydraulic motors, one set being high-speed low-traction units for traveling and the other low-speed high-traction units for cutting. Hydraulic pumps powering the system are driven by four 230-volt-d.c. electric motors totaling 75 hp. Two 30-hp. motors provide the power for the rotating heads, one 7½-hp. motor for the conveyor

COLMOL SPECIFICATIONS

ELECTRIC

230 volts d.c.

Rotating heads: two 30-hp. 1,150-r.p.m. motors.

Conveyors: one 7½-hp. 1,150-r.p.m. motor.

Traction drive: one 7½-hp. 1,150-r.p.m. motor.

DRIVES

All drives fluid.

Rotating heads: supercharged hydraulic capable of developing 3,000 lb. pressure per square inch.

Traction: hydraulic high-speed range (traveling speed); 20 to 35 f.p.m.; infinitely variable between minimum and maximum.

Low-speed range (mining or working speed), 0 to 60 in. per minute; infinitely variable.

HEADS

Two rows of five each. Heads separate hydraulically to adjust cutting height as the seam varies. Average cutting height, present model, 48 in.

Entire head assembly (both upper and lower rows) raises and lowers hydraulically for traveling or to take care of rolls in the coal seam.

BITS

Spring-held. Entire set may be replaced by one man in less than four minutes.

CONVEYOR

Hydraulically driven.

Three separate double-link chains operating as single conveyor.

Flight design.

TRACTION

Hydraulic drives, crawler type.

Each side driven independently with independent and infinite speeds from maximum to minimum, either forward or reverse, permitting Colmol to rotate 360 deg. about center of gravity of machine.

MACHINE

Width of cut: 9½ ft.
Height of cut (average): 48 in.
Width of machine: 8½ ft. max.
Height of machine: 38 in.
Length (over-all): 24 ft. 9 in.
Weight: 52,000 lb.

drive and one 7½-hp. motor for the traction drive.

The forward speed of the machine, which is infinitely variable, determines the rate at which the chipping heads are fed into the coal. Increasing the feed speed increases lump production, it is reported, by increasing the pitch of the helix created by the advancing teeth. If the lumps become too large, the rotary chipping heads crush them to a size that can be conveyed readily. Thus, the designers point out, a uniform product results, generally free of bugdust and fines and with a uniform top size.

By driving ahead and then dropping back and setting over, entry width may be increased, it is stated, or an opportunity afforded for inspecting the chipping heads in any position.

Hydraulic cylinders are utilized to move the entire cutting head assembly up and down, to tilt the cutting head assembly forward and backward and to vary the distance between the top and bottom rows of cutting heads. Each of these motions may be controlled separately by manually-operated valves that permit the operator to accurately position the cutting head of the machine. Other hydraulic cylinders similarly controlled are provided to raise and lower the tail of the conveyor as necessary to load into a shuttle car or conveyor. These cylinders also are controlled by a manually-operated valve.

The hydraulic pump supplying oil under pressure for manipulating the cutting head and conveyor tail is driven by a constant-speed electric motor that also powers another pump supplying oil under pressure to a hydraulic motor driving the conveyor. This hydraulic motor also may be started or stopped as required by a manually-operated valve. The control valves are so arranged as to make it unnecessary to start and stop the electric motor to operate the hydraulic cylinders or the hydraulic motor.

Hydraulic motors also are employed for the crawler drive. To facilitate steering, each track has separate motors, with the speed controlled independently by manually adjustable valves. Manually-operated control valves also are provided for reversing. The traction speed and direction of travel may remain constant once they are adjusted.

To supply the traction required when the machine is cutting, which is considerably greater than that required to move the machine to and from the work, and to provide the lower travel speed employed when cutting, two hydraulic motors are used on each crawler drive, one pair for low-speed high-traction and the other for high-speed light-traction operation. Shifting from the low- to high-speed motors is accomplished by manually-operated control valves actuating hydraulic clutch-shifting cylinders which, in turn, alternately engage and disengage high-speed and low-speed clutches. The valves also hydraulically interlock the low- and high-speed motor controls to make it impossible to operate any of the hydraulic traction-drive motors when the clutches are being operated.

The hydraulic pump supplying oil under pressure to the traction-drive motors is driven by a separate constant-speed electric motor that is kept running at all times when traction is required.

Cutting heads on the Colmol are driven by a pair of hydraulic motors connected in parallel to distribute the loading on the gears in the heads. The pumps also are connected in parallel so that their combined delivery is available to drive the two hydraulic motors. As a result, the torque loading on both the two hydraulic motors and the two electric motors is equalized.

Automatic hydraulic controls quickly stop the hydraulic motors by means of hydrodynamic braking if a severe overload is encountered at the cutting heads, with auxiliary electric controls stopping the electric motors powering the pumps. An electric pushbutton permits the operator to quickly stop and start the hydraulic motors driving the heads while the electric motors continue to run.

The oil reservoir is equipped with oil filters, plus air cleaners in the breather lines to prevent dust from entering the reservoir. Hydraulic relief valves in each pump circuit act as safety valves so that no damage occurs if an excessive load is encountered.

Once the excessive load is removed, the Colmol may resume operation without replacing any shear pin or other mechanical units. The manually-operated valves, the designers state, are located on a panel that is readily accessible to the operator and permits him to control all linear and rotary motions from a convenient point at the rear of the machine.

"MINED AND PREPARED WELL," strip coal "can strongly compete in quality with much deep-mined coal from the same area" . . . But "the coal buyer must be shown that this quality strip coal is a good buy—and that it will keep his costs to a minimum."

The Crisis in Strip Mining

Return of a Buyer's Market Brings With It Discrimination Against Strip Coal Growing Out of Past Practices of a Small Minority—The Remedies Include Good Preparation and Organized Promotion

By E. H. MARRUS

General Manager, Troy N. Beaver Coal, Inc., Punxsutawney, Pa.

NOW THAT COAL SUPPLY is at least equal to demand, the strip mines have been the first to feel the effects of a softening of the market. This has occurred in spite of the fact that the coal-stripping industry can take credit for a real achievement in supplying the extra fuel needed for the war effort—and in spite of the fact that the majority of the strip operators made a sincere attempt to turn out a product offering the buyer a full measure of value. The exceptions—and there were a number—are the big reason why an important part of the stripping industry now finds itself in a position of some difficulty, and why the industry as a whole should be taking a number of important steps to re-establish the market position it deserves.

The increased resistance to strip coal by buyers has been bolstered by the relative increase in the supply of deep-mined coal. "Why buy strip coal when we can get deep?" is the attitude frequently encountered in the market.

"THIS IS THE TIME FOR ACTION" by strippers and their sales agents, with the assistance of equipment manufacturers, to put across to buyers the story of good, clean strip coal, says Mr. Marrus.

Yet, at the same time, many stripping operations are continuing to operate. Generally, these have preparation facilities and market a higher grade of coal.

Part of the blame for the present situation finds its way back to the operators themselves. When coal was in short supply, much poor quality product was loaded. In the rush to satisfy the demand, some operators went pretty far out into the "grass roots" and cleaning sometimes was neglected. Somehow the railroads and industries made the best of the situation, in spite of occasional engine failures, furnace difficulties and the complaints of their combustion engineers. In all fairness, however, it should be noted that during the same period a considerable quantity of questionable deep-mined coal was marketed.

The purchasing agents have memories. They recall the poor coal they sometimes had to buy—and now some of them turn down ALL the strip coal offered to them. As a result, much high quality strip coal, low in ash and high in B.t.u. content, is not being marketed.

The fallacy here is that the many

"THE STRIP OPERATORS must face the facts as they appear. There is discrimination against strip coal . . . The purchasing agents have memories. They recall the poor coal they sometimes had to buy—and now some of them turn down ALL the strip coal offered to them."

strippers are being punished for the faults of the few. The situation brings back the stories of how the Nazis penalized all the inhabitants of a village for the hostile acts of a few individuals.

The strip operators must face the facts as they appear. There is discrimination against strip coal. While some pits as yet have barely felt the pinch, if this "no strip coal for me" attitude continues, they in time also will be affected. The current attitude also works to the detriment of the industrial consumer, because he loses the advantages of buying lower-cost B.t.u. content.

Strip coal has an important place in the market. Constituting one-fifth of the country's bituminous production, it necessarily plays a feature role in the coal picture. Mined and prepared well, it can strongly compete in quality with much deep-mined coal from the same area. Since its production cost per ton is lower than in underground mines, price competition is easy. Generally, strip coal can undersell the underground-mined product.

Fundamentally, the buyer of coal is looking at the end result. From steam coal he seeks maximum heat units at the lowest cost possible; from metallurgical coal he wants the best product obtainable, and so on. Now, in a buyer's market, he is able to choose from among many. Those purchasing agents who scorn coal that is stripped—and refuse to purchase any at all—have been criticized as not adequately discriminating between the fine and the poor coal produced by stripping.

There is much good strip coal now being marketed. The responsible stripper—and there are many of them—has "got religion." He knows that the days of "load it all" are past. If he wants to keep his economic health, he must ship a quality product. This lesson was learned in a painful manner, and the operating stripper today is the one who knows his lessons well. The railroads and industry will benefit in securing a better product at a lower price.

This message must be brought home to the coal buyer. It is to his advantage, as well as to that of the operator, that the facts are understood.

To effectively put across this message will require the joint action of the stripper and his sales agents. Joining them in this effort should be the manufacturers of strip-mining equipment, who also have a sizable stake in the game.

A preliminary plan of action may be as follows:

1. Strip operators must keep their houses in order. Many of them have been doing so—and shipping only quality products. They have left the croppy and inferior coal in the ground. They have kept the coal clean, realizing that real estate has no place in a coal hopper. Care is taken in picking and processing at the tipple. All this has been done at little extra cost. It is primarily a matter of discrimination and supervision.

With a clean coal of high quality, the task of selling strip coal should be much easier.

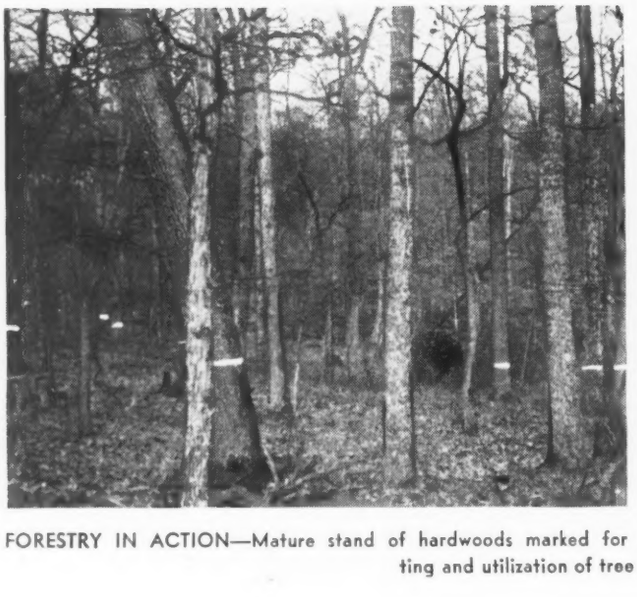
2. The coal buyer must be shown that this quality strip coal is a good buy—and that it will keep his costs to a minimum. This is not to say that strip coal will replace the underground-mined product entirely, but rather that each has its place in the power-production market. The sales agent who maintains a personal contact with the buyer must carry the burden of this task.

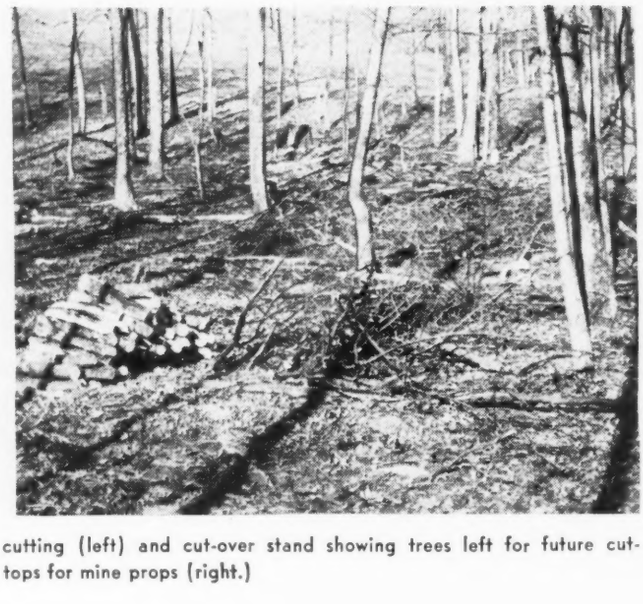
3. Buyers should be invited to visit strip mines and their preparation plants.

4. Printed matter presenting the story in an interesting manner, showing how clean strip coal is mined and processed, can be circulated among the buyers. Here is where the equipment manufacturers can be of considerable help by preparing their own literature and also helping finance others.

Since there is no one organization speaking for all strip operators, the present would be an excellent time for such a group to be formed. The responsibility for the promotion of the strippers' story would be centralized. It is a public-relations job—the selling of an idea.

This is the time for action. Sectional differences and competition among shippers must give way to the common cause. The situation today is a challenge to the strippers' well-being.





FORESTRY IN ACTION—Mature stand of hardwoods marked for cutting (left) and cut-over stand showing trees left for future cutting and utilization of tree tops for mine props (right.)

Mine Timber Through Forestry

The Coal-Mining Industry's Stake in Good Forest Management—What the Goals Are and How Industry Is Organizing to Achieve Them—Key Factors in Obtaining Maximum Timber Yield With a Minimum of Cost

By H. D. BENNETT
Forester, Appalachian Hardwood Manufacturers, Inc., Cincinnati, Ohio

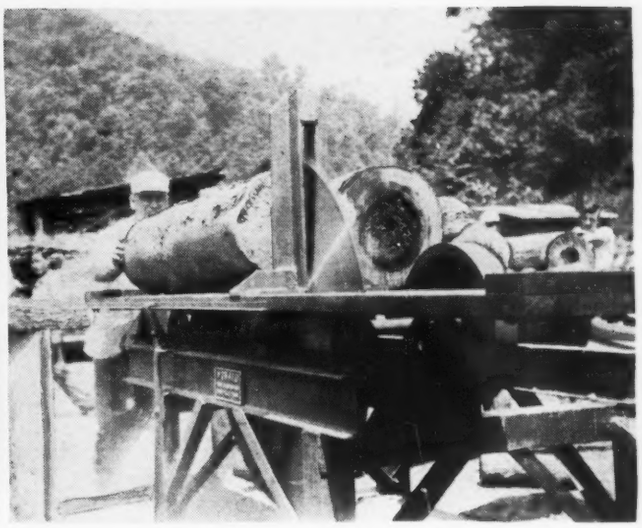
COAL IS THE BASIS of the economy of a large portion of the Appalachian region. Large quantities of timber are required for the mining of coal, and to insure the future supply of needed forest products at a reasonable cost, adequate fire control and sound, economic forestry practices are necessary.

The development and maintenance of a forestry program is a job for private industry. The Appalachian hardwood region is an area well suited by soil, climate and topography for growing timber. With proper forestry measures these timber stands will renew themselves and maintain an adequate supply of wood to meet the demands of the vast coal and lumber industries located within the region. With this thought in mind the Appalachian Hardwood Manufacturers, Inc., has established a forestry division and invited into membership not only Appalachian hardwood-lumber producers but also land owners and coal operators, since they also have a vital stake in an adequate timber supply. To date, some 1,100,000 acres have been listed by members who are investing 1c. per acre of land or timber holdings per year to support the work of the division.

READY FOR USE—Props, headers, wedges and cap boards in a mine timber yard. Good forest management will assure an adequate supply at low cost.

The program is under the direction of a professional forester who has had experience buying timber and supervising logging operations for private concerns and who is responsible to a forestry committee composed of eleven members of the forestry division. The forestry program is looking to the future and has four primary objectives:

1. Establishment of a forestry program on the lands of the listed members.
2. Support of legislation on a state level favorable to adequate fire control, the lumber industry and related activities.
3. Solicitation of increased membership to permit expansion and intensification of the program.
4. Establishment of a research



NEW EQUIPMENT TO INCREASE YIELD of usable material includes the hand bow saw, shown in prop production (left), and the bolting machine (right) sawing props from low-grade timber.

program that will provide the answers to many of our problems and demonstrate the economic value of forestry practices.

Adequate fire control is the first consideration in the establishment of a forestry program. This is being accomplished by supporting state programs that will efficiently man, equip and finance organizations to prevent and suppress forest fires. Cooperative agreements between land owners and operators and the state organizations are encouraged and, in areas where the state does not provide adequate protection, fire-control plans and training of woods workers in fire prevention and suppression are initiated.

Proper Tree Cutting Sought

The program also is aimed at establishing proper cutting practices by demonstrating forestry methods best suited to the conditions on the ground and to the needs of the operator. Proper forestry practices must maintain a balance between the silvicultural needs of the forester and the economic and physical needs of the operator. The program has demonstrated that through such practices we insure maximum production of wood from the soil, obtain maximum production per unit of labor in harvesting the timber and insure a future cut.

Trees about 8 in. in diameter usually are about 35 years old and at that time are just getting their crowns up into the sunlight and putting on commercial growth. If cut they will produce about one header. If left to grow ten years longer, they will produce two headers per cut, and if the stand of timber is managed on a 20-year cutting cycle, which is the best for the maximum production of mine timber, the volume of wood available is proportionately increased. These small trees represent a small percentage of the volume of a stand but a large proportion of the number in the stand. Compared to growing from the ground up after complete cutting, leaving small trees results in a more efficient operation and more wood from a given soil area. Stands of timber in which trees from 12 to 20 in. are cut offer maximum production of mine material and the best returns per unit of labor.

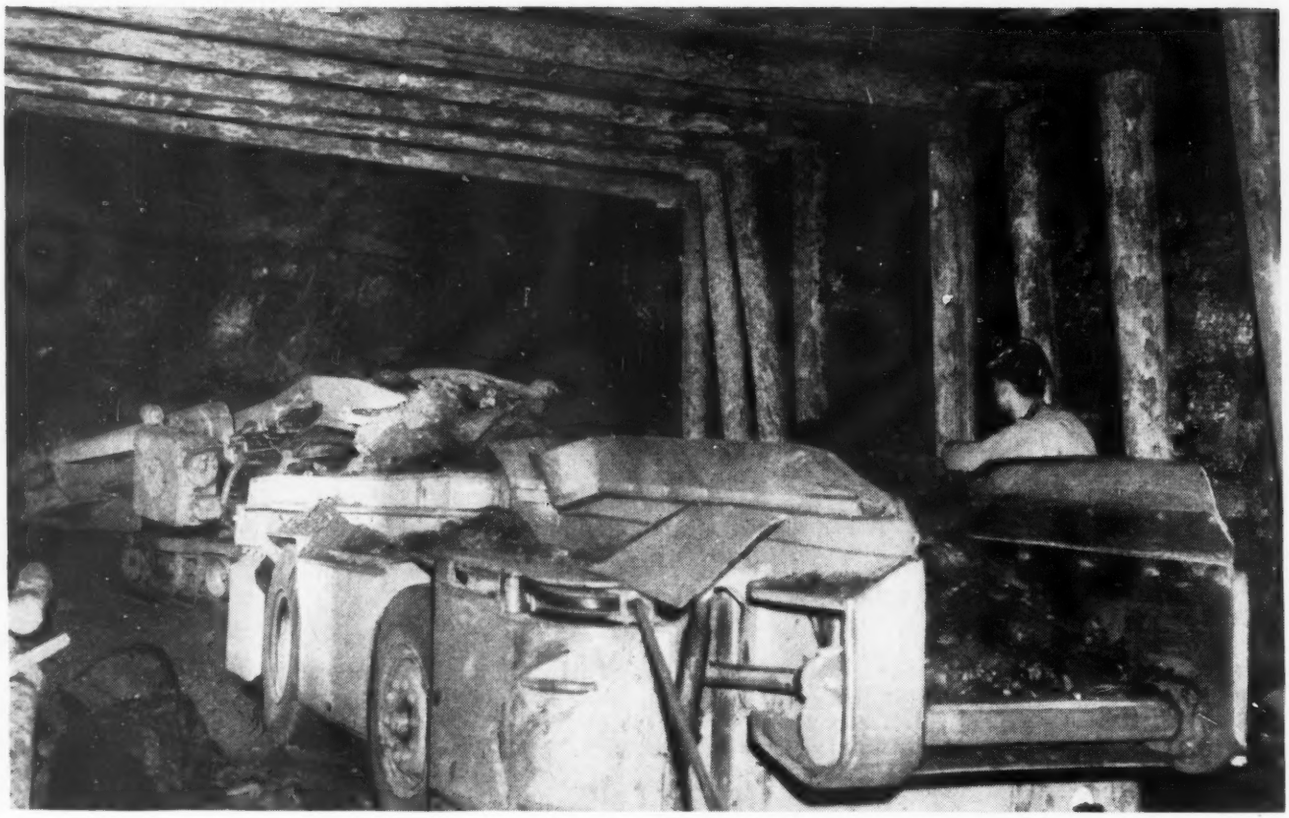
In developing management plans and cutting budgets, trees can be selected to give the operator an economic cut, supply coal-production needs and leave a stand of smaller trees that will insure a future cut. If roads are built in the area on a capital-investment basis and sowed with a soil-holding plant to prevent erosion when current operation is completed, they will be ready for use in the next cut with a minimum of maintenance.

Proper utilization of available timber in the woods is the third important consideration. In old stands of virgin timber, we were *cutting* trees for use and had tools, equipment and operating methods to do an efficient job. Today, in our second-growth stands of timber, we are *growing* trees for use and must adapt our tools and equipment, our operating methods and our thinking to meet the new situation. Forestry measures must be supplemented by efficient and economic operating methods.

Thinning to increase growth is necessary in some stands of pole-size timber. In others, the problem is one of economically removing large defective trees to put the stand in proper condition for forestry practice on a sustained-yield basis. In this connection the forestry division has introduced the hand bow saw for increasing prop production from thinnings in stands of pole-size timber and in certain instances from tree tops; also the bolting machine for sawing props and other short material from timbers formerly classed as unmerchantable. Through the use of these tools, otherwise unmerchantable material can be utilized and thus open a new source of wood for the mines while leaving the timber stand in better condition for future growth. The use of power equipment wherever economically feasible also is stressed.

Demonstrations Show Results

To bring the program and the economic advantages of forestry to as many interested individuals as possible, field demonstrations are held from time to time. Points stressed include proper cutting practices in timber stands, the proper use—through demonstration—of logging equipment and cutting tools, and the advantages of timber treatment with a good wood preservative. Over all, the program is aimed at demonstrating that forestry is an economically sound investment from which good returns can be expected. Many operators are putting it to work and the benefits will grow as the number increases.



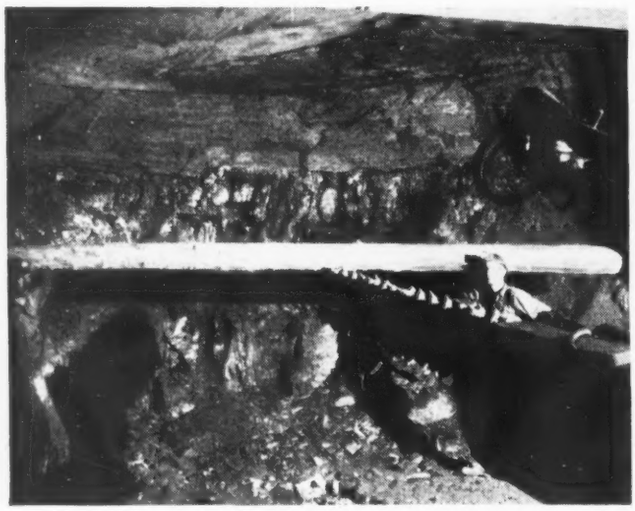
TYPICAL WORKING PLACE in a pillar section in Sunnyside No. 2 mine being mined by a loading machine and a cable-reel shuttle car with a built-in elevator. The shuttle cars regularly operate on grades averaging 10 percent and as high as 12 percent in places.

Concentration at Sunnyside

New Trackless-Mining Equipment and Concentration in Not Over Four Working Places per Unit Provide Best Answer to Bad Top and Raise Tons per Man in the Section

50 to 100 Percent at Sunnyside No. 2 Mine

CONCENTRATED TRACKLESS MINING, with not over four places per unit as a general rule, has been found the best answer to bad top in the Sunnyside No. 2 mine of the Kaiser Co., Inc., Sunnyside, Utah. The property produces coking coal for the Kaiser steel interests and is



FIRST STEP IN SETTING A CROSSBAR with the cutting machine—bar laid on the bits and steadied by two men.

SECOND STEP IN SETTING A CROSSBAR with the cutting machine —bar raised to the top, with men steadying it with poles.

LOADING MACHINE working with shuttle car in a pillar place protected by an average of three crossbars per cut.

HEAVY TIMBERING—in some cases skin-to-skin—normally is necessary after places reach about half their length.

operated by R. G. Heers as manager, with Tom McCourt as superintendent, Frank Markosek and John Peperakis as mine foremen and W. J. Hillabrant as mining engineer.

More Trackless Units Planned

Four of the new trackless units were in service at Sunnyside No. 2, when this article was prepared, with four more shuttle cars expected before the end of 1948. Among other things, the new units are increasing tons per man in the section 50 to 100 percent. Auxiliaries include portable and semiportable power units with dry-type transformers for a.c. service to all face equipment except shuttle cars and safety circuit-breaker centers for all units and for lighting. Other improvements include special mantrip equipment and cast-steel wheels for mine cars. Timber setting with the new rubber-tired cutters is an outstanding feature of the Sunnyside operation.

Sunnyside No. 2 mine is recovering the Lower Sunnyside seam, averaging 10 ft. in thickness and ranging from 9 to 11 ft. The average dip is 10 percent, running up to 12 in places, and it is believed that Sunnyside No. 2 is the first to regularly operate shuttle cars up pitches of these magnitudes. The material immediately over the coal, locally known as cap rock, is a shale streaked with coal and carbonaceous material. Above the cap rock, or interval, is the Upper Sunnyside seam, about 5 ft. thick. Thickness of the cap rock varies from 2 ft. at the south end of the mine to 24 ft. at the north end. Wherever the rock between the two seams thins down to less than 3½ ft., it is mined with the coal. In such places, the cap rock is considered too dangerous to be supported on timber.

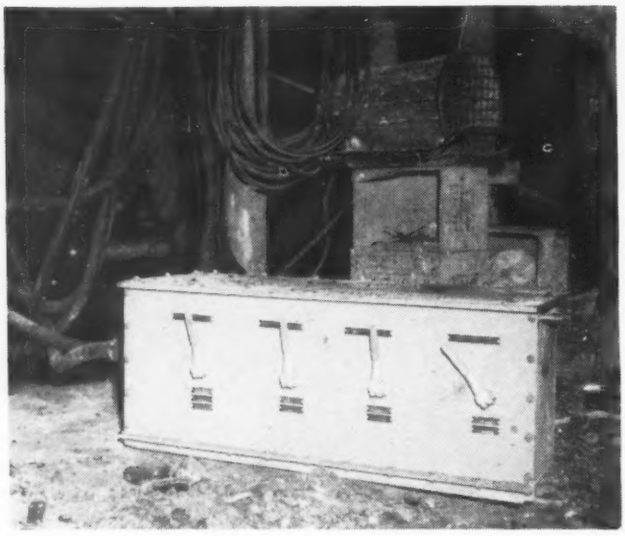
The main opening to Sunnyside No. 2 is a level locomotive haul through a mine previously worked out. This haul, two miles long, terminates at the top of a coal slope sunk straight down the pitch about the center of the property. Entries consisting of two headings 16 ft. wide on 50-ft. centers are turned right and left off the slope at intervals providing room lengths of approximately 250 ft.

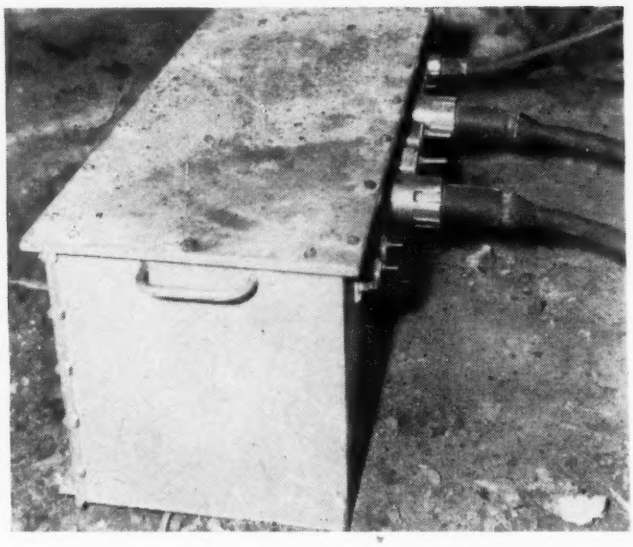
The entries are driven to the boundary on each side and rooms and pillars are worked back on the retreat, leaving a bleeder heading on both sides of the property. The air is blown down the slope and splits both ways, going across the gob at the end of each room entry and through regulators into the bleeder openings. These bleeders also would provide emergency escapeways in case of disaster. Plenty of air, careful checking for gas, thorough sprinkling and rock dusting, and the use of permissible or flameproof equipment, however, reduce the possibility of a major explosion to a minimum.

Growing Top Trouble a Factor

Increasing weight, in combination with the fragile nature of the immediate top, brought about the condition which resulted in a decision to go to concentrated trackless mining with rubber-tired equipment. Good top is found in only limited parts of the mine and, as entries were worked back and down the dip from the old mines on each side, increasing weight resulted in more and more top trouble and heavier and heavier timbering, particularly on the left, or northwest side of the property. As a result, it became increasingly difficult to keep places open long enough to complete them with the equipment formerly employed. Therefore, it was decided to change to something that would have maximum capacity, mobility and flexibility, permitting

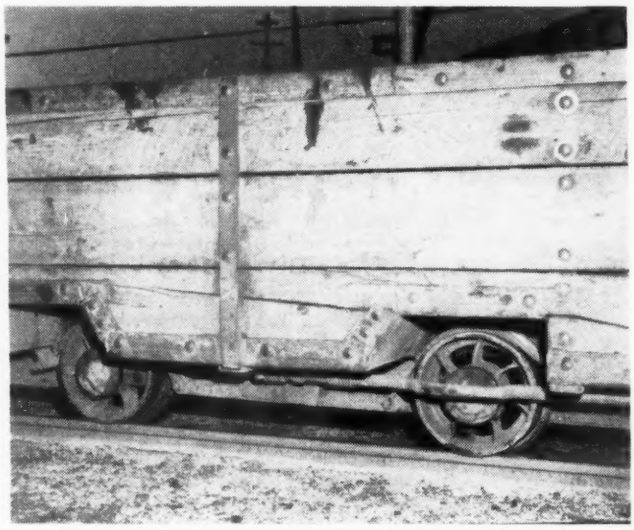
New Auxiliary Equipment Adds to Efficiency at Sunnyside



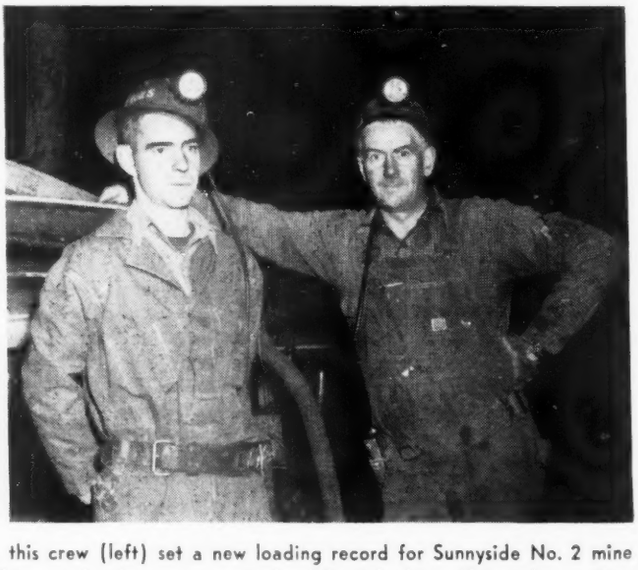


ONE OF SEVERAL CIRCUIT-BREAKER CENTERS for protecting the new mining units. They serve both a.c. and d.c. equipment and provide lights. Each section is provided with its own power sources, fed by 4,000-volt armored cable.

POWER FOR A PRODUCTION UNIT is supplied by this combination of dry-type transformer (left) and skid-mounted m.g. set (right).



CAST-STEEL MINE-CAR wheels with anti-friction bearings are among late developments for higher efficiency at Sunnyside No. 2.



RECORD BREAKERS—Using an 11BU loading machine in 5th Right, this crew (left) set a new loading record for Sunnyside No. 2 mine June 24 by producing 60 cars averaging 5.2 tons each. Walt Whitman, faceboss, poses at the left with Jerry Hernandez, cutter; Don Larson, operator; and Bill Cave, motorman. The record was established in two pillar places. RIGHT PHOTO—W. J. Hillabrant (left), mining engineer, with E. C. Jensen, faceboss.

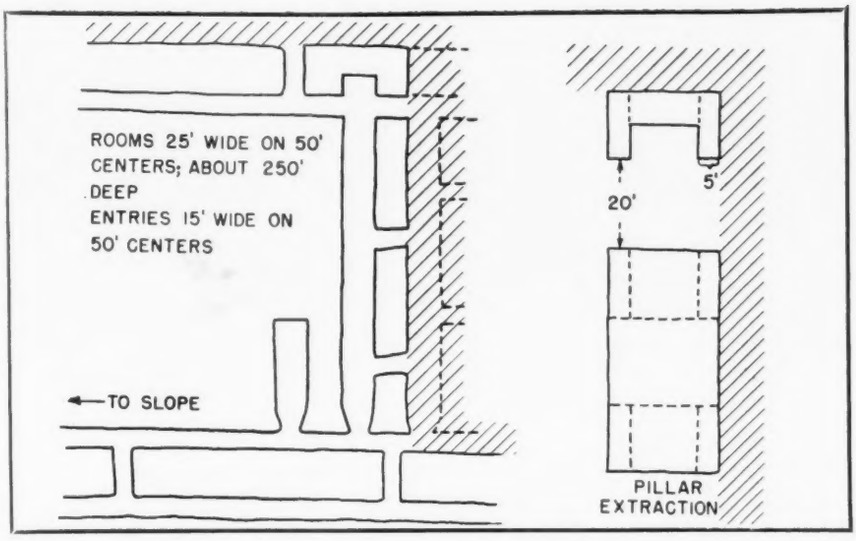


FIG. 1—GENERAL PLAN for a two-place working section (left), with usual pillar-extraction method at the right. Rooms are 25 ft. wide on 50-ft. centers.

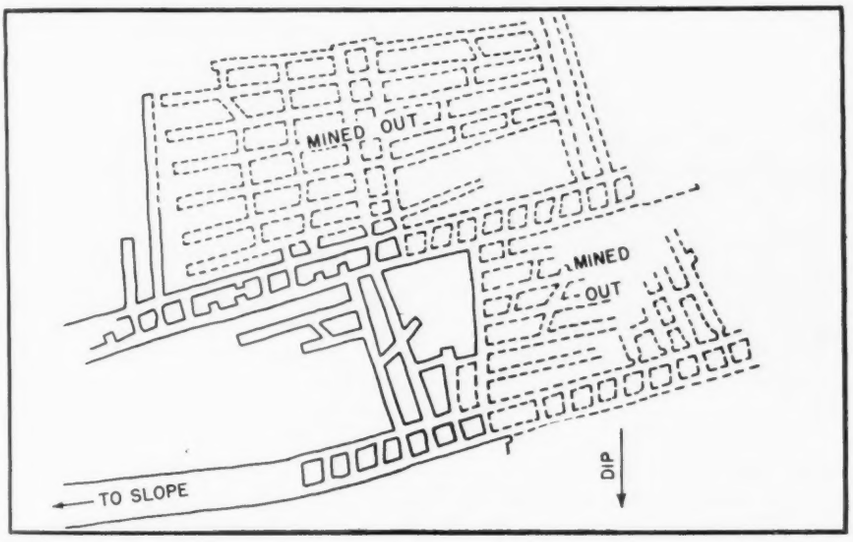


FIG. 2—TWO EXAMPLES of working with subentries and rooms in sections with very bad top. Driving rooms to the left lessened roof troubles substantially.

quick completion and maximum output from the smallest possible number of places. In addition, it was hoped that the equipment also would lend itself to doubling in brass in timbering, thus easing that very serious problem.

As a result of intensive study of the problem it was decided to adopt production units made up as follows: one Joy 11BU loading machine, one 10RU rubber-tired cutting machine carrying a Sullivan CD23 coal drill and useful also for setting crossbars, and one 5-ton 42E two-wheel-drive-and-steer cable-reel shuttle car with built-in hydraulic elevator for transferring the coal directly to the mine cars—a total of three pieces of equipment per unit, counting the combination cutter and drill as one.

Four of these units, as previously noted, were in service when this article was prepared and four more were expected to go into operation before the end of the year. The present shuttle cars were among the first to be equipped for dynamic braking and are now being revised with so-called emergency dynamic braking so that braking still will be available in case of power failure for any reason. The shuttle cars to come, however, were specified for four-wheel drive and steer. The extra traction is expected to help on the heavy grades. In addition, the new cars also will be able to turn sharper corners and will be built for heavier duty.

Loaders and cutters under the new set-up are operated on 220 volts a.c.; shuttle cars, 250 volts d.c. Each section is provided with its own power sources, fed by 4,000-volt armored cable. One power source is a wheel-mounted 100-kva. three-phase Westinghouse dry-type transformer. The other is a 40-kw. m.g. set with Reliance motor and General Electric generator mounted on a skid base. These m.g. sets will supply sufficient power for two shuttle cars, plus an elevating conveyor, if and when the extra car and elevator are employed. All the equipment, including the m.g. set, is served through four-breaker six-outlet Mines Equipment Co. circuit centers. These centers are backed up by circuit breakers on the transformer units. The centers, as noted, also carry the m.g. sets, which are equipped with standard Mines Equipment outlets for the shuttle-car cables. This arrangement eliminates fused nips and splices.

Production Units Protected

The circuit centers are combination outlets for either shaker-conveyor or loading units. Three of the breakers protect the principal equipment units while the fourth breaker and the extra outlets are used for blowers and for lighting around the loading station and elsewhere. The a.c. connectors are four-pole units—three power and one ground. In compliance with the Code, a solid ground is carried back to the rail. The transformers are equipped with changing taps to make it possible to keep voltage up at all times. The connection from the transformer to the circuit center is a 4/0 cable in 200-ft. lengths, with the same style of connectors.

Standard crews for the new trackless units consist of eight men, as follows: loader operator and helper; shuttle-car operator; cutter and helper, who do all the cutting, drilling and face timbering; timberman for general work behind the face, motorman and faceboss. Mine-car capacity is 5 tons, the same as the shuttle cars. Trips are brought to the loading station and spotted there by a locomotive. The average time to change a trip is 10 minutes; the maximum 15 minutes. The interval normally is employed in timbering, which always is necessary.

The small crew, matching the small number of working places, is considered best under Sunnyside No. 2 conditions because the men can work more steadily and with less lost motion. Typical of results is the record of one crew with some six months' experience at the time this article was prepared. In June, this crew averaged 20.5 tons per man, compared to about 11½ tons per man with conveyors under simi-

lar conditions, and 16 to 16½ tons with loading machines feeding onto conveyors, the second general set-up preceding the advent of rubber-tired mining. By and large, it is expected that the new units will double the previous average tons per man.

Number of places with the new equipment frequently will be as low as two. However, where roof conditions permit, the number will be expanded to three or four—perhaps more if the top is good. Fig. 1 shows diagrammatically operation with two places. As indicated, one is kept ahead of the other so that the work normally is a combination of room driving and pillaring, including the chain pillars on the entry above.

Room width is 25 ft.; centers, 50 ft. Crosscuts are made on centers of not over 100 ft., except in entries where, in new work, blowers are employed and the centers are increased to 200 ft. Entries normally are driven with shaker conveyors, although loading machines also are employed at times.

Room Pillars Extracted

While the method may be varied to suit conditions, room pillars normally are extracted, as shown in Fig. 1. A split 20 ft. wide is driven through at the top, leaving a section two to three cuts thick. This section then is removed by taking successive cuts, leaving stumps or fenders about 5 ft. thick on each side. If possible, these stumps are loaded. Otherwise they are permitted to crush—usually the case—or are shot to bring about a cave. The machine then drops back and repeats the process until the pillar is completely extracted.

Where top conditions are particularly difficult, several variations on driving straight up the pitch and pulling pillars immediately are practiced. One is driving a pair of rooms up and then turning rooms right or left, thus making the original pair, in effect, subentries. Fig. 2 is an example of sections mined in this fashion. In these sections it was found that there was little improvement in those places turned to the right. Driving in the opposite, or left-hand, direction, however, resulted in a substantial decrease in roof troubles. As in regular operation, the number of places is kept to three or four as a general rule, and frequently two. Pillars normally are mined back to the subentry as previously described, with the final operation removal of the pillars between the subentry places.

The 10RU cutting machines at Sunnyside No. 2 are equipped with 9-ft. bars. The bars are Sullivan water-type units putting the water out at the end. They are equipped with Bowdil chains and bits. Places normally are center sheared, in addition to undercutting, and are drilled with Coalmaster and McLaughlin equipment. The breaking medium is Hercules Red HB and Coal Powder sheathed permissible. Some 12 to 14 holes are required for a cut-and-sheared place 20 ft. wide and 9 to 11 ft. high. Because a squeezing condition is normal after pillaring starts, places sometimes are cut and not shot, or are drilled and popped without cutting. Average yield of coal per pound of powder is 3 tons.

Timbering Requirements Heavy

Because of bad top, about half the time of the crew is spent in timbering. Normally, three crossbars are set per cut and, as the rooms progress, it frequently is necessary to set additional bars almost skin to skin, as shown in one of the accompanying illustrations. It is expected that over a million lineal feet of round timber will be used in 1948 for a production of about half a million tons. Posts and crossbars are specified with a minimum tip diameter of 7 in. So-called "king" bars used at crosscuts and other similar openings as supports for the regular crossbars are 22 ft. long as a rule, with a minimum tip diameter of 10 in.

Crossbars Set With Cutters

Crossbars are set with the help of the 10RU cutters—a major factor in the purchase of this equipment. The cutter-bar is turned up in shearing position and then a bar is laid on the bits and raised to the top, as shown in accompanying illustrations. When it gets above man height, it is steadied by poles. Once the bar is clamped against the roof, the men use timber horses in obtaining measurements and setting the legs. One result of the use of the cutting machine for placing bars is a reduction of approximately two-thirds in labor cost for timber setting.

Mine cars, as previously noted, are supplied to the working sections by locomotives, which receive them from the main inside slope hoist, which in turn gets them from mainline locomotive equipment on the level rail haul from the main portal. The slope hoist is a 600-hp. Nordberg straight-drum unit (two 300-hp. motors). The original double-reduction gearing is being changed to single, and dynamic braking is being added for lowering. The revisions will permit increasing the size of the trips from the present 8 to 12 cars.

The mine cars are Watt composite units with a tare weight of 4,800 lb. and an average capacity of 5.2 tons of coal. Some 345 are in service. The original wheel equipment was cast iron, with Timken bearings. Forged wheels then were adopted as far as they could be obtained. Now, however, sufficient Sterling cast-steel wheels are on hand for about half the present number of cars and additional ones will be obtained to completely equip all the cars. Major advantages of the steel wheels are elimination of flat spots and breakage. Any flat spots that may develop, experience has shown, are quickly rolled out in service. Breakage in the three months the wheels had been in service up to the time this article was prepared was nil.

New Man-Trip Cuts Travel Time

Safety in handling men has been materially improved by installation of a Watt man-trip. In addition, because it was possible to use these cars on the inside slope, a saving of approximately 10 minutes of working time per shift was achieved by eliminating walking down to and back from the working entries.

The man-trip consists of ten cars, each with a capacity of 14 to 16 men. The cars are covered and are built on standard trucks. Seats are back-to-back down the center of each car, which makes it easy for men to get out in case of rope breakage or other difficulty on the slope or elsewhere—if they choose to try to get off instead of staying with the equipment. The front and rear cars are equipped with Plexiglass windows, brakes and manually-operated drags in charge of designated men for use if necessary. The drags are arranged so that when they are dropped they do not strike solid and wreck the trip. Rather, they cut a few inches into the tops of the ties, thus slowing down and stopping the trip gradually in case of necessity. Tool compartments are built under the seats, thus saving the time that otherwise would be involved in men walking to and from the special tool car otherwise required by Utah law.

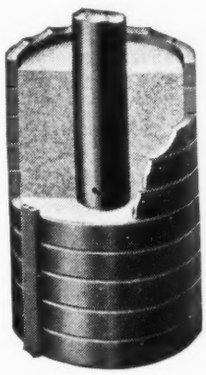
Exide IRONCLAD BATTERIES

HAVE ALL FOUR VITAL CHARACTERISTICS FOR SAFE, DEPENDABLE MINE HAULAGE SERVICE

1. **HIGH POWER ABILITY** . . . abundant reserve power plus an ability to discharge at high rates.
2. **HIGH ELECTRICAL EFFICIENCY** . . . hence low power costs.
3. **RUGGEDNESS** . . . to withstand hard usage.
4. **LONG LIFE *and* MINIMUM MAINTENANCE** . . . which add up to better service at a saving.

Because of these outstanding qualities, Exide-Ironclad Batteries are used by more mine operators than all other batteries combined.

Most batteries look much alike on the surface. But inside are the differences that determine power, performance and battery life. One notable difference in Exide-Ironclad construction is the positive plate.



THE POSITIVE PLATE consists of a series of slotted tubes which contain the active material (see small illustration at left). So fine are these slots that, while permitting easy access of electrolyte, they retard active material from readily washing out . . . thus assuring years of safe, dependable, day in and day out mine haulage service.

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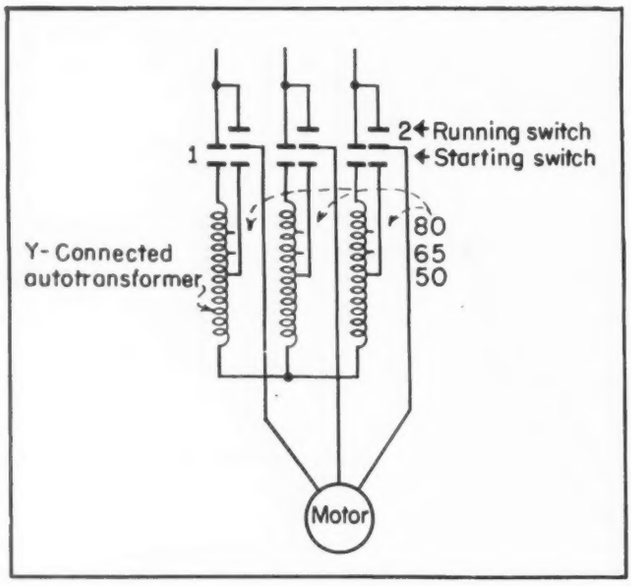


FIG. 1—A THREE-COIL autotransformer connected in Y for reduced-voltage starting.

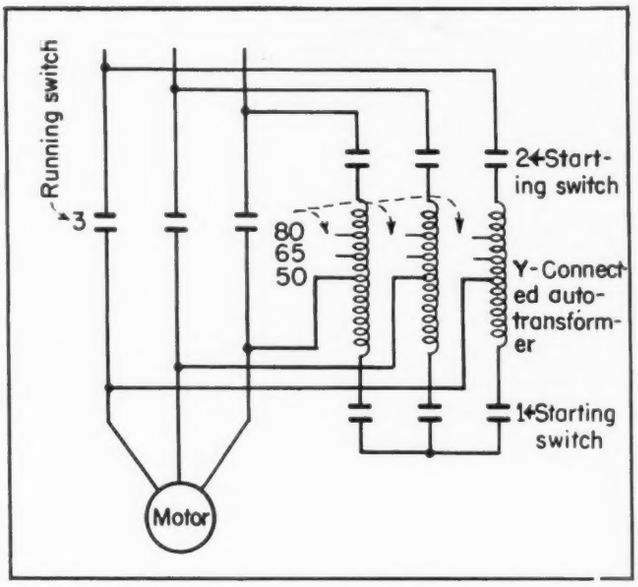


FIG. 2—THE MOTOR remains energized during the transition period with this autotransformer starter.

Reduced-Voltage Starting Of Squirrel-Cage Motors

REDUCED-VOLTAGE STARTING often is applied to squirrel-cage motors in various services, such as driving belt conveyors where they reduce belt strain during the starting period. Limiting the motor's starting torque, especially when the belt is heavily loaded, does much to extend belt life and probably helps to reduce conveyor maintenance. The three most used methods of reduced-voltage starting (Figs. 1 to 4) are: (1) autotransformer, (2) starting resistor and (3) starting reactor.

The autotransformer-type starter is perhaps the most expensive and the most widely used of the three types. It is built in both the two- and the three-coil models. The two-coil type is usable on both two- and three-phase circuits. This feature, while important to some industrial users, does not apply to mining installations where the polyphase systems are all three phase. The operation of the two-coil autotransformer during the motor's starting period is similar to the operation of a motor on a V or open-delta bank of transformers.

The three-coil autotransformer (Fig. 1), also referred to as a compensator, is operated with the three coils, or "legs," connected in Y, and balanced three-phase voltage is applied to the motor terminals. A choice of three starting voltages usually is available, namely: 50, 65 and 80 percent of line voltage. Using the 50-percent tap reduces the line current to one-quarter the motor's across-the-line starting current. The motor on half voltage takes half of the current that it would if it were connected directly across the line. This current is supplied by the secondary of a two-to-one autotransformer, thus reducing the line current to half the motor current (already reduced to half its across-the-line starting value). Therefore, the double reduction reduces the line current to one-fourth that which would be taken were the motor started across the line.

Since the torque of the motor varies as the square of the voltage applied to its terminals, the torque, on the 50-percent tap, would be only 25 percent that which the motor would develop if started across the line. This question may arise: "Will the motor, operating on the 50-percent tap, start and accelerate the load in a reasonable period under all conditions of load? If not, then the 65-percent tap or perhaps the 80-percent tap should be used. The conditions imposing the severest starting assignment should be considered when selecting the tap.

The autotransformer, it should be noted, is intended only as a starting device and should not be permitted to remain in the circuit very long. The length of the accelerating period or the time that the autotransformer is in the circuit, therefore, is quite important. Since the autotransformer is designed only for intermittent service it is well to guard against too frequent starting when numerous power outages occur during a storm.

While the Y-connected autotransformer starter (Fig. 1) draws less starting current from the line than the resistance-type starter (Fig. 3) for the same starting torque, it is responsible for two inrush current swings during the starting interval. The first inrush of current occurs when the six lower contacts are closed. The second inrush of current occurs at the end of the transition period after the starting contacts have been broken and at the instant the upper three, or running, contacts are closed. The initial inrush is considered desirable

. . . Reduced-Voltage Starting of Squirrel-Cage Motors

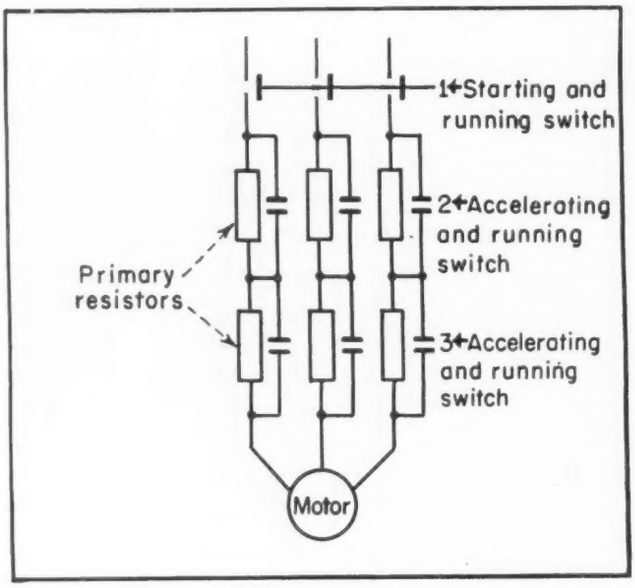


FIG. 3—HOW RESISTORS can be wired in the primary of the motor circuit to accomplish reduced-voltage starting.

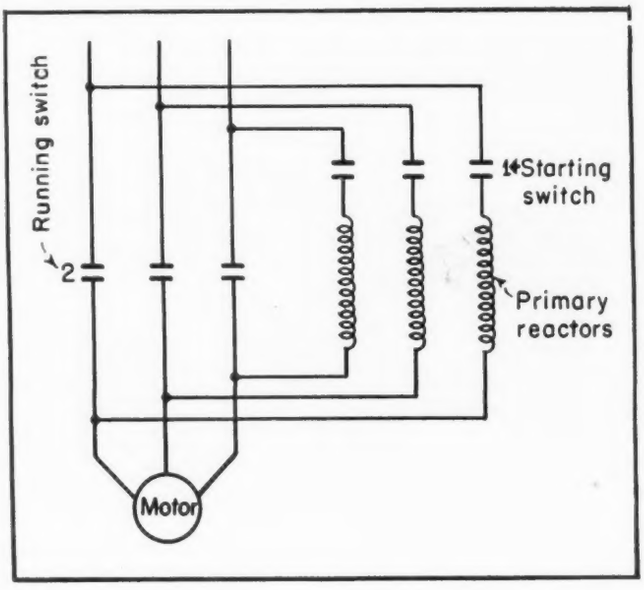


FIG. 4—PRIMARY REACTORS provide another method of starting the motor on reduced voltage.

in starting loads that have high static friction and where across-the-line starting cannot be used. The sudden inrush of current produces momentarily a high torque which will "bump" the load loose. This cannot be accomplished with a primary-resistance-type starter.

Among the disadvantages listed for the autotransformer starter are: (1) constant voltage during the starting period and until the motor is connected to full line voltage; (2) momentary disconnection of the motor from the line during transition from reduced- to full-voltage operation, which can produce a high current inrush; and (3) low power factor (increased by the magnetizing current of the autotransformer).

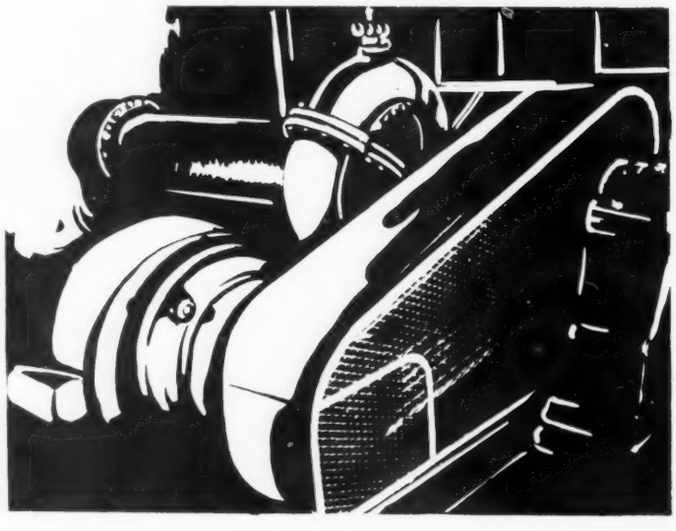
The special switching arrangement in Fig. 2, also for a Y-connected autotransformer starter, gets away from the disadvantage of momentarily disconnecting the motor from the line during the transition period. It also reduces the magnitude of the second inrush of current. The starting procedure is as follows: (1) close Switch 1 to connect the autotransformers in Y; (2) close Switch 2 to start the motor on reduced voltage; (3) after the motor has sufficient speed, open Switch 1 and close Switch 3; (4) open Switch 2 immediately after the closing of Switch 3, thus connecting the motor across the line and switching the autotransformers out of service.

Primary-resistance starters (Fig. 3), with resistors connected in series and provision for short-circuiting the taps, provide another method of starting squirrel-cage induction motors on reduced voltage. The cost of the resistance-type starter, depending on the number of accelerating steps, generally is less than the autotransformer type and it has the added advantage that the motor circuit is never opened during the accelerating period. Short-circuiting the resistor taps in succession permits the motor to accelerate smoothly and with a gradual increase in torque. As previously stated, the resistance-type starter, because of its exceptionally smooth starting characteristic, is not suitable for starting high friction loads.

The reactor-type starters (Fig. 4), while not as popular as the others, provide another means of starting squirrel-cage motors on reduced voltage. The reactance or impedance method provides a low terminal voltage at the motor since the large starting current causes a large voltage drop in the reactors. The motor current decreases as the motor speeds up, resulting in less drop across the reactors and a higher voltage at the terminals of the motor. The rise in speed is greatest at light load when the small current results in only a small drop across the reactors. Unlike the autotransformer method, the reactor method permits the motor voltage to increase gradually, depending on the nature of the load.

When the reactors are provided with taps it usually is necessary to open the circuit in going from one tap to another, as it is not feasible to short-circuit taps of windings wound on the same core.

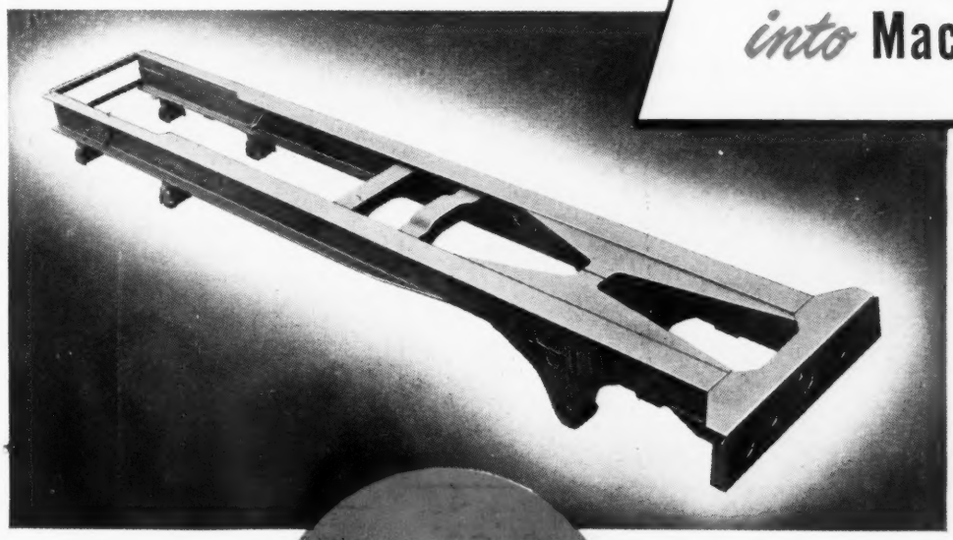
With both series resistors and reactors the torque varies as the square of the voltage across the motor, and the line current and the motor current are proportional to the voltage across the motor. In the case of the autotransformer-type starters the line current varies as the square of the voltage across the motor.



30-Ton Payloads are hauled with unfaltering ease over the toughest terrain on Mack's Model LRSW. There's abundant power in its 275 h.p. diesel engine. Positive traction because of its Balanced Bogie and exclusive Power Divider. Safe and sure control through hydraulic power steering, air-assisted clutch, air-actuated brakes, short turning radius and offset driver's seat.

You get more work *out* of Mack Trucks

because...we put more work *into* Macks



Massive ruggedness, unrivalled in the truck field, stands clearly revealed in the Model LRSW frame. Electrically welded into one piece, it combines brawny cross members, ample gusseting, and huge reinforced I-beam side members of alloy steel, 13-11/16" deep with 8" flange.

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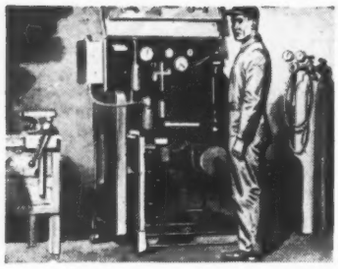


Operating Ideas

Improved Steam Table Speeds Drying of Samples

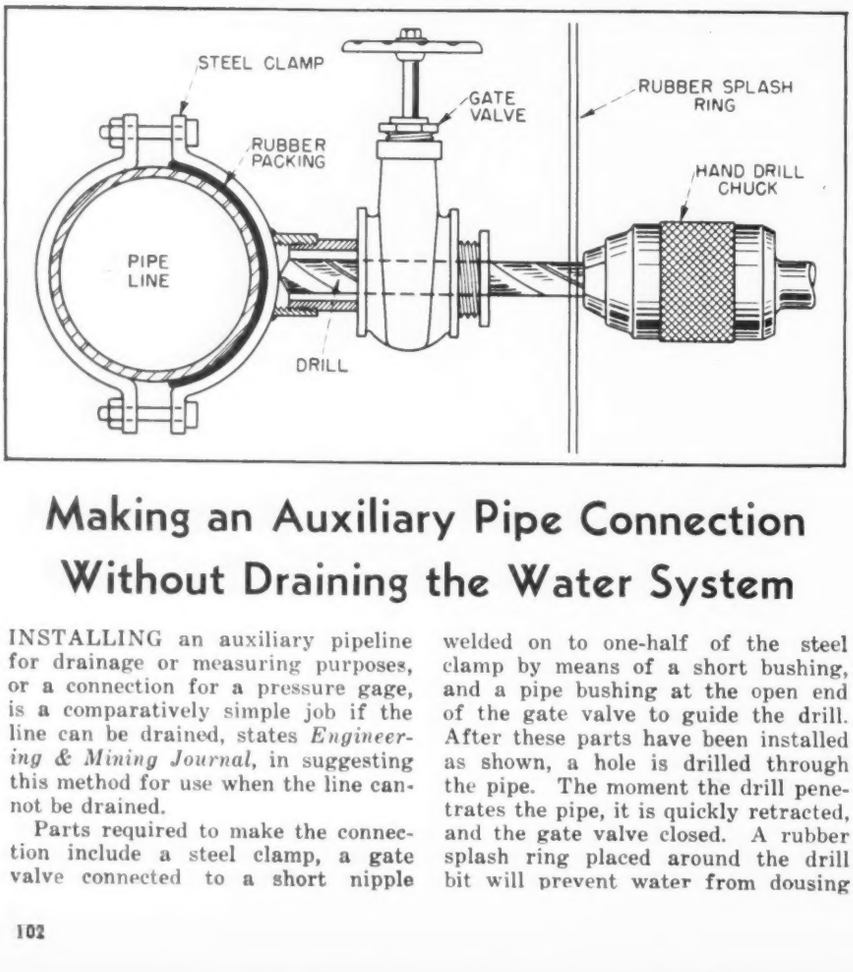
WILLIAM LAUBAUGH, assistant coal inspector, stirs the coal samples occasionally as they are drying on the steam table.

AN EXPOSED steam-heated table cuts drying time for anthracite samples from two hours to 15 minutes declares William Laubaugh, assistant coal inspector Loree colliery, The Hudson Coal Co., Plymouth, Pa.

The five-compartment drying table shown in the accompanying illustration is used for drying pea-size and smaller samples in accordance with coal-inspection requirements. The surface moisture of the coal is readily driven off because of the table's large heating surface—and being exposed the vapor floats away.

Under the old method the samples were dried in an inclosure in trays placed on steam pipes. The transfer of heat from the steam pipes to the trays was slow, consuming as much as two hours in the case of the finer sizes.

The new dryer with steam in contact with all of the heating surface speeds the drying of the samples, thus shortening the time required for testing each railroad car of fuel.



Making an Auxiliary Pipe Connection Without Draining the Water System

INSTALLING an auxiliary pipeline for drainage or measuring purposes, or a connection for a pressure gage, is a comparatively simple job if the line can be drained, states *Engineering & Mining Journal*, in suggesting this method for use when the line cannot be drained.

Parts required to make the connection include a steel clamp, a gate valve connected to a short nipple welded on to one-half of the steel clamp by means of a short bushing, and a pipe bushing at the open end of the gate valve to guide the drill. After these parts have been installed as shown, a hole is drilled through the pipe. The moment the drill penetrates the pipe, it is quickly retracted, and the gate valve closed. A rubber splash ring placed around the drill bit will prevent water from dousing the workman while the gate valve is being closed.

Installation of additional pipe lengths or gages can now be made with ease. By using this method, the time and expense of draining the pipe system and recharging it can be saved. The job itself requires about one hour, it is said, which is much less than would be required if the connection were made in the conventional way.

Credit Due?

WHILE YOU may have used some of the ideas appearing in this section to advantage, are you getting the full credit and recognition from your associates and other mining men for your own operating ideas that publication might bring? Send us the mechanical, electrical, safety or operating ideas that have worked for you. COAL AGE, incidentally, will pay you $5 or more for each, on publication.

Memo from our RAW MATERIALS DEPT.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION
OFFICE MEMORANDUM

DATE 8/11/48

TO. Metallurgical Dep't.

SUBJECT: Performance of Heat Treated JALLOY Steel at Benson Mines, Star Lake, N. Y.

1" x 6" heat-treated JALLOY #3 flats to reinforce truck-body bottoms and doors. Service--severe impact loading of hard rock magnetite ore from 5-yd. shovel. Year round operations in temperatures to minus 47°F. Severe abrasion in unloading. Installations have been in service 13 months --305,000 tons handled per truck. Units equipped with these flats maintain bottom flatness and clean readily. Insignificant wear at this date indicates at least 2 years life before replacement is necessary.

WHAT better "laboratory" could we find to prove the qualities of J&L Steel than in the equipment required in our own operations?

The handling and moving of heavy, abrasive ore-bearing rock, at our Benson Mines, is a rugged test for any equipment. Yet our stone trucks equipped with heat-treated J&L JALLOY Steel reinforcing strips have run *more than a year* without bottom replacements. *And recent reports indicate at least two years life!*

These JALLOY strips receive the full impact of huge rocks *dropped* into the truck bodies, and withstand the abrasion caused by dumping load after load. This continuous resistance to shock is particularly noteworthy because of the embrittling effect of the sub-zero temperatures encountered during winter months.

J&L JALLOY is a fine-grain, heat-treated steel made in a wide range of physical properties with tensile strengths of 155,000 to 180,000 lbs. per sq. inch. Its inherent ability to withstand shock and abrasion adds life to equipment that must be tough and strong—such as: Rock crushers, Scrapers, Bulldozers, Dump cars, Power-shovel buckets, Truck bodies, Sandblasting equipment—or wherever abrasion and impact are limiting factors.

Manufacturers of trucks and trailers designed for heavy service will find JALLOY an excellent material for body bottoms, reinforcing strips exposed to severe abrasion, tail gates and many other applications. You'll find that JALLOY is a steel that stands up when the going gets tough. For more complete information, let us send you the booklet: "*Jalloy*—J&L *Alloy Steel*." It includes data on properties, heat treatments and workability. The coupon at the right is for your convenience.

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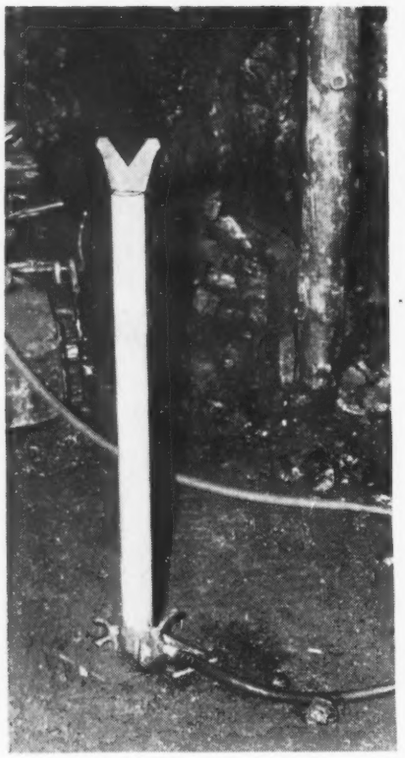

JACK POSED WITH HOSE CONNECTED but without a crossbar in the fork.

JACK EXTENDED as it would be in lifting a crossbar to the roof.

ONE VALVE ADMITS WATER to raise the jack. The other releases it.

Water Powers Timber Jack

TIMBER JACKS operated by water power have materially simplified the placing of crossbars at Sunnyside No. 2 mine of the Kaiser Co., Inc., Sunnyside, Utah. Before these jacks were developed, a coal height of 9 to 11 ft. and the necessity for setting as many as three crossbars per cut because of bad top posed a real problem. In other words, working from timbering horses and lifting the bars by hand was hard, time-consuming and hazardous. Now, crossbars are placed by the rubber-tired cutting machines in most sections (see p. 92 of this issue), but the water-powered jacks still find use in special sections or openings still worked by the equipment originally employed at the operation.

The jacks operate off the sprinkling lines laid into every working place and are designed to function on the minimum pressure normally encountered—about 35 lb. per square inch. The original jacks were built of steel tubing. Weight, however, was an objection, and later models were built of aluminum tubing and can be handled easily by one man.

As shown in the illustrations, the jacks consist of a fork, three sections of aluminum tubing, two of which telescope, a foot and two valves with nipples. The sprinkling hose is connected to one nipple and the valve is opened to raise the fork and crossbar. As long as the valve is open, water pressure holds the bar tight again the roof, leaving the men free to measure, cut and set the legs. When the bar is secure, opening the second valve permits the water to drain and the jack to telescope to carrying length.

HOW A SECTION of pipe may be installed to protect a valve attached to a water tank.

Protecting Valves On Water Tanks

SHIELDS MADE from pipe make good protectors for valves attached to steel water tanks. Valve connections to tanks often are subjected to abuse on the job, and sometimes are used as a step by workmen, lacking the proper respect for valve fittings, when climbing over tanks. Unprotected valves on portable field equipment are the targets of many knocks.

The valve protector, shown in the accompanying illustration, protects a valve and its connection to a water tank that services drilling equipment at a stripping operation. The pipe shield has been welded to the tank and three fins have been added as bracing. Notice that a section of the shield has been cut away beneath the valve to facilitate the dismantling of the valve. This idea is, of course, equally applicable to underground installations.

- KING KOAL underground CONVEYOR BELTING was developed and is being manufactured by Hamilton Rubber Mfg. Corp., to keep pace with the advent of underground conveyor belt systems.
- In every KING KOAL BELT is incorporated the essential qualities for economical conveying of coal with the positive assurance of long and uninterrupted service.
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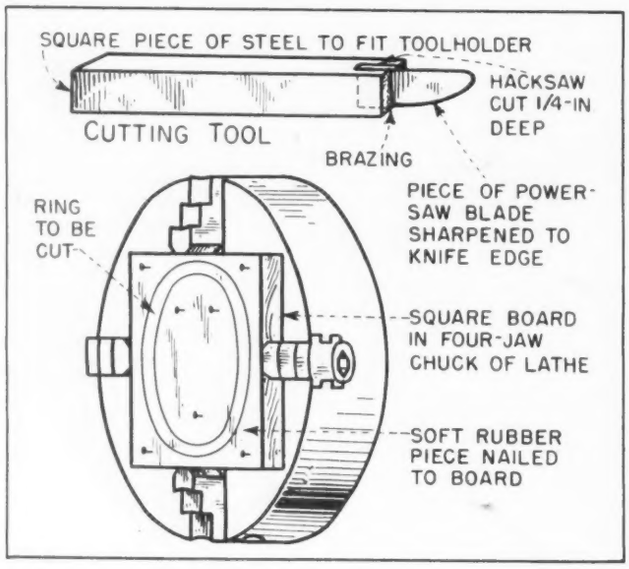
SHOWING USE OF the spider to move duckbill over. The pointed end of the bar is under the duckbill.

Spider Slues Duckbill Automatically

USE OF BARS to move duckbills over has been sharply curtailed by employing the spider shown in the accompanying illustration at the Gorgas mines of the Alabama Power Co., Gorgas, Ala. The spider, as shown, consists of a round bar with a point on one end (not evident because it is under the duckbill) and a handle at the other. It is held up off the floor at the handle end by a crosspiece turned down at each end to form feet.

In operation, the spider is placed on the bottom and the duckbill is started back. When the duckbill shovel, or flare, comes back far enough, it strikes the sloping bar of the spider and is raised off the floor enough so that its own weight causes it to slide on the bar and move over ready for the next advance. By pulling the spider out and putting it back between several strokes, the duckbill can be slid over any desired distance.

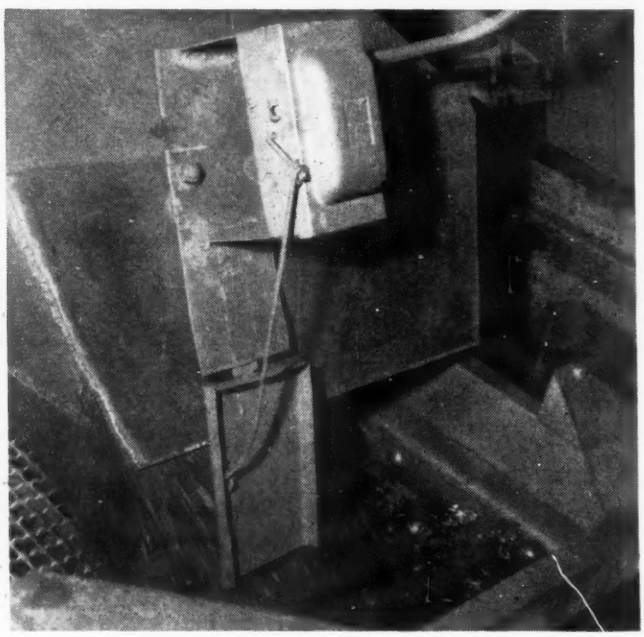


Cutting Rubber Rings

THE ABOVE METHOD of cutting gaskets, packing or seal rings out of sheet rubber with an ordinary lathe tool, submitted by Charles Labbe, Las Vegas, Nev., has been reported by *Engineering & Mining Journal*. It was developed for gasket too large to be punched out.

The cutting tool is prepared as shown. Then a piece of soft rubber is tacked to a block of wood mounted in the lathe chuck. The cutting tool is mounted in the tool holder and set to cut the inner circle; then the outer circle. A smooth ring or gasket results.

Gaskets can be prepared in a similar way on a drill press. A double tool holder is used, however, and the inner piece of the ring is cut out first. It is also important to keep the rubber from wrinkling while the tool is in a deep cut. Rings of sheet lead to fit grooved flanges of high-pressure pipe can be prepared in the same way.



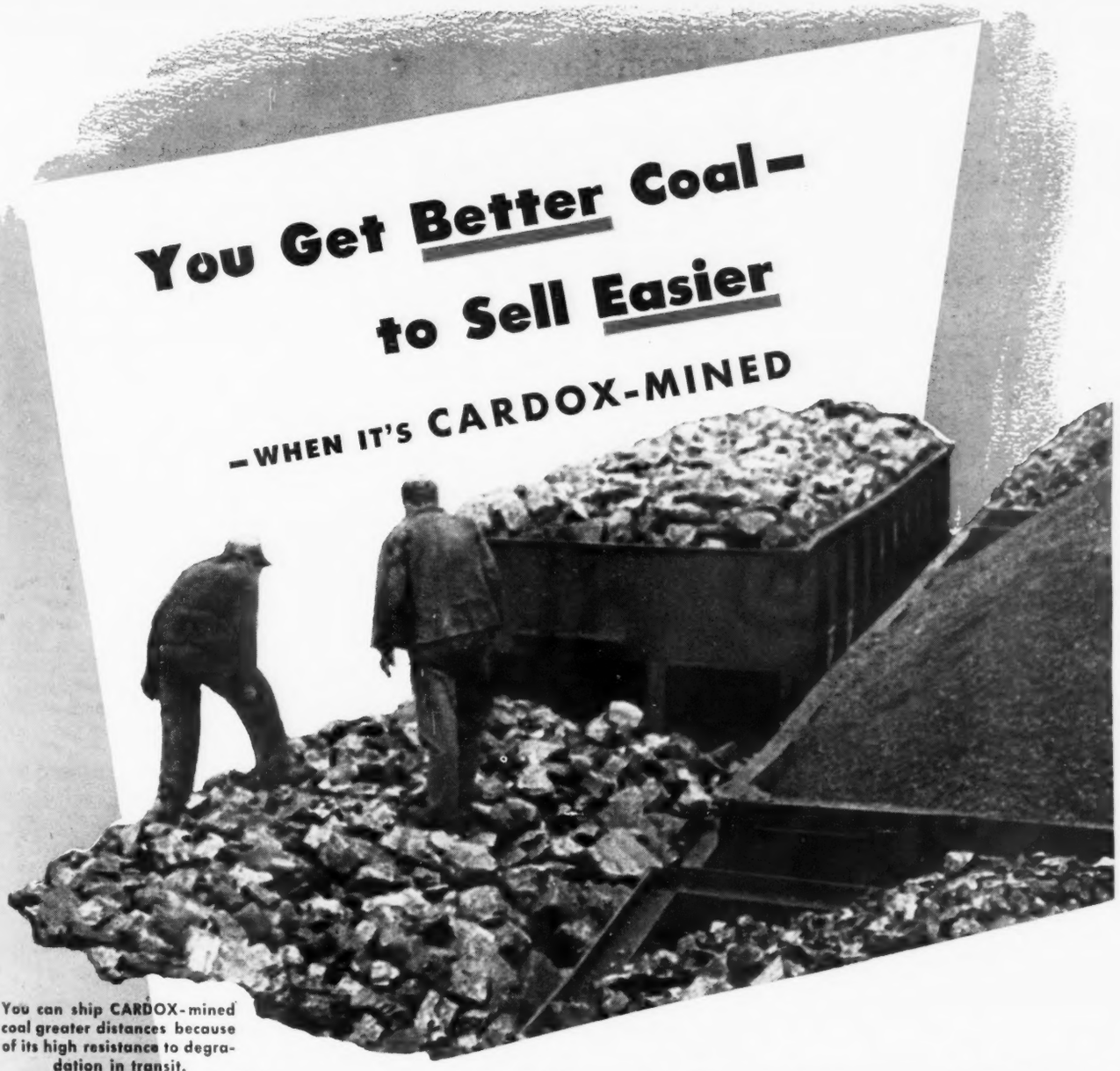
Paddle Switch Protects Vibrating Screen

TO PREVENT possible damage to equipment, as well excessive operation with improper screening, vibrating-screen equipment for fine-coal sizing at the Black Diamond preparation plant of the Black Diamond Coal Mining Co., Black Diamond, Ala., is protected by paddle switches. One installation is shown in the above illustration.

The paddle, as shown, hangs above the screen surface. If the screen blinds and coal builds up, the paddle eventually is moved up and closes a switch. This in turn actuates relays which shut down all equipment ahead of the screen, which then can be cleaned out.

You Get Better Coal—to Sell Easier

—WHEN IT'S CARDOX-MINED



You can ship CARDOX-mined coal greater distances because of its high resistance to degradation in transit.

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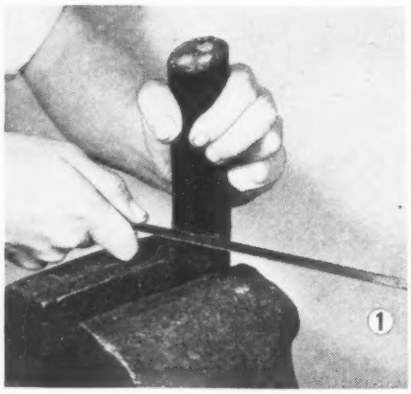
Stripping Insulation From Large Three-Conductor Cables

THIS METHOD of stripping the insulation from large three-conductor cables and installing the bared wires in terminal plugs has been evolved by Ohio Brass engineers to produce a neat workmanship-like job, according to a recent issue of the company's publication, *Haulage Ways*. The larger and heavier trailing cables now required for modern mining machinery are considerably harder to strip and install than smaller cables, especially by the haphazard method of whittling, it is pointed out.

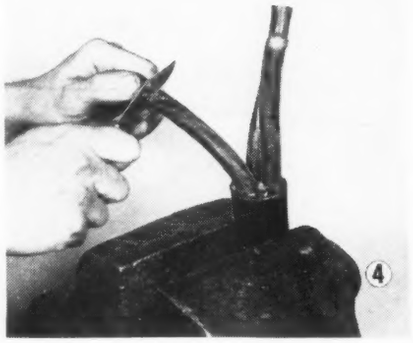


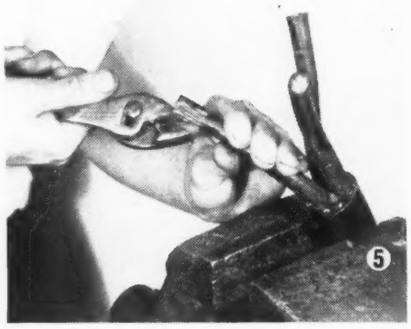
1. USING a hacksaw blade, make a circular cut around the cable sheath at the desired length. Extreme care should be used to prevent cutting the insulation surrounding the three individual conductors or the benefit of the insulation will be lost and a short circuit result.

2. MAKE a second cut lengthwise with a hacksaw, again taking care not to cut into the insulation around the three individual conductors.

3. PEEL the sheath away from the conductors with a pair of pliers. Cut away the rope filler, leaving exposed only the individually insulated conductors.

4. MAKE a circular cut around the conductor insulation. A knife may be used but be careful not to nick the copper strand. Next, make a lengthwise cut, following the method shown in Step 2.

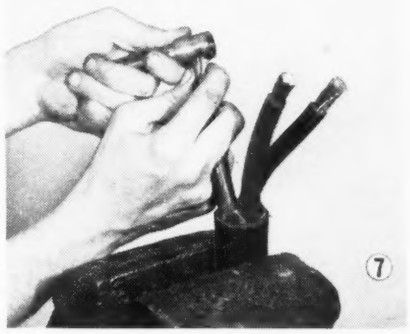




5. PEEL away the conductor insulation with a pair of pliers and repeat Steps 4 and 5 on the other two conductors.

As often happens with large cables, the bare conductor must sometimes be inserted in a terminal whose hole is only slightly larger than the diameter of the bare conductor itself. Since the individual strands will fan out or fray at the point they are cut off, the entire conductor end should be slightly chamfered to permit it to be inserted neatly and easily. Such chamfering, however, should be done without reducing the current-carrying capacity of the strand. The following three illustrations present a handy method of chamfering.

6. FAN OUT the six outer strands to make the center strand readily accessible and cut off approximately ¼ in. of the center strand with a pair of side-cutting or diagonal pliers. Rewind the outer strands to their original position, bending in the ends to fill the space usually occupied by the center strand.



7. THE BEVEL resulting from Step 6 makes it easy to insert the conductor into an otherwise tight fit.

8. SINCE the bevel is so short—about ¼ in.—the set screw will bear on all seven strands, providing full conductivity.

Another Thermoid *First!*

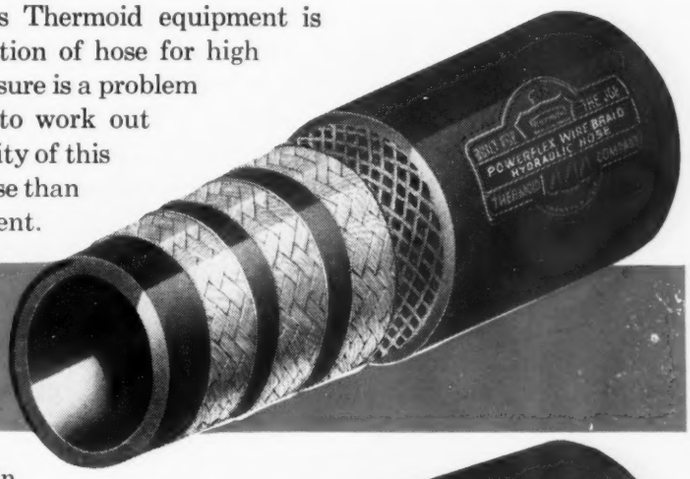
New Wire Braiding Equipment Produces Larger, Stronger Hose for High Pressures

The world's largest wire braiding machine specifically designed for the manufacture of hose is now in production at Thermoid's modern Nephi, Utah, plant. The possession of this equipment enables Thermoid to make wire braid hose in larger sizes and with greater strength than had previously been possible.

Hoses of 2, 3 or 4 braids can be made on this machine in sizes up to 2½" I.D. That means Thermoid can make hose that will rival pipe in strength but still have the flexibility of rubber. The specifications of Thermoid's hose for carrying high pressure are superior to any current production on the market.

If Pressure Is A Problem

In addition to the hoses specified below, this Thermoid equipment is available for special designs involving construction of hose for high pressure work. If you have a hose use where pressure is a problem give us the overall facts. We will undertake to work out a practical design that can use the unusual capacity of this machine to produce a stronger, more compact hose than could be made by any other method or equipment.



Powerflex Wire Braid Hydraulic Hose

Can now be produced in sizes from 3/16 to 2" I.D. in 50 ft. lengths, in 1, 2, 3 or 4 braids, working pressures from 500 to 5,000 lbs.

Powerflex Wire Braid Steam Hose

Practically burst-proof because of the wire braid reinforcing.

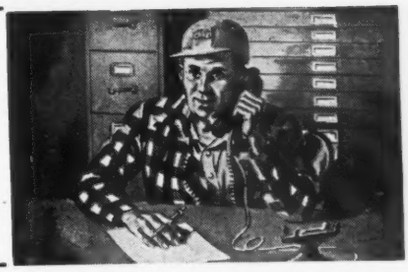
Recommended for pressures up to 200 lb. saturated steam. Specially compounded tube resists heat—asbestos cord layer dissipates heat and forms a permanent bond to the tough, rubber cover. Available in sizes ½ to 2½" I.D. and in lengths up to 50 ft.

The Thermoid line includes: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Custom Molded Products • Industrial Brake Linings and Friction Materials.

Thermoid

Thermoid Company • Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U. S. A.
Automotive and Industrial Rubber Products • Friction Materials • Oil Field Products

News Round-Up



National Coal Appoints Air Pollution Committee

As a further forward step on the part of bituminous coal producers to deal on a national basis with the more efficient use of coal and coal-burning equipment and thus assist in air purification and the elimination of smoke, an air pollution committee composed of five industry leaders has been appointed by Charles A. Owen, president, National Coal Association. The appointment is in line with a resolution adopted by the N.C.A. board of directors at a recent meeting that called for the development and promotion of such a program.

R. L. Ireland, chairman of the executive committee of the Pittsburgh Consolidation Coal Co. and president of the Hanna Coal Co., is chairman of the new committee. The other members are: O. L. Alexander, president, Pocahontas Fuel Co., New York; D. W. Buchanan Jr., vice president, Old Ben Coal Co., Chicago; Charles R. Griffith, president, Southern Coal & Coke Co., Knoxville, Tenn.; and William H. Ritter, president, Reitz Coal Co., Windber, Pa.

The committee, working in conjunction with other existing agencies, will initiate an educational campaign in the field of air purification, with special emphasis on the economical burning of solid fuels to eliminate smoke, as well as dealing with the many elements other than coal that are present causes of pollution. The campaign is expected to also include advertising in trade and general magazines and talks by members of the N.C.A.'s speakers bureau. Cooperation of retail dealers, equipment manufacturers and other groups will be sought.

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Mines Bureau Establishes New Honor Certificates

Fourteen men in the mining industries, five of them engaged in coal mining, will receive the newly established Bureau of Mines Certificates of Honor in recognition of their prompt action in saving lives through their knowledge of first aid, James Boyd, director of the Bureau announced Nov. 12. All 14 award winners were trained in first aid by the Bureau's Health and Safety Branch.

Since 1927, the announcement pointed out, the Joseph A. Holmes Safety Association has been presenting medals to members of the mining and allied industries for heroic action in saving lives. Numerous cases have been reported to the Association of lives being saved through first aid treatment without personal risk of life. It is to recognize such meritorious actions that the Bureau has established the Certificate of Honor.

The coal men slated to receive the awards are: Leroy Miller and Don Bishop, employees of the Utah Fuel Co., Sunnyside, Utah; Elmer V. Smith and Edward W. Venable, employees of the Alabama By-Products Corp., Praco, Ala.; and Joseph P. Reese, an employee of the Locust Coal Co., Shenandoah, Pa., who was scheduled to receive the first presentation at ceremonies to be held between the halves of a local football game at Shenandoah, Nov. 12.

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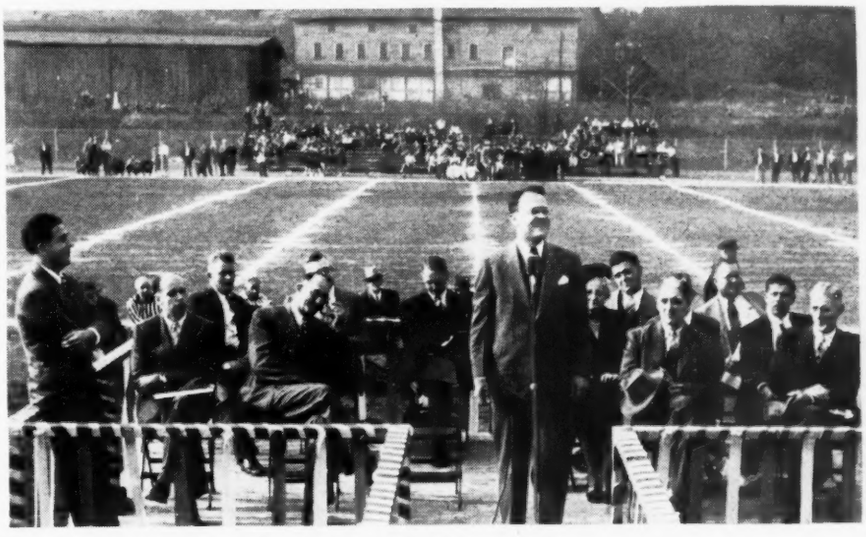
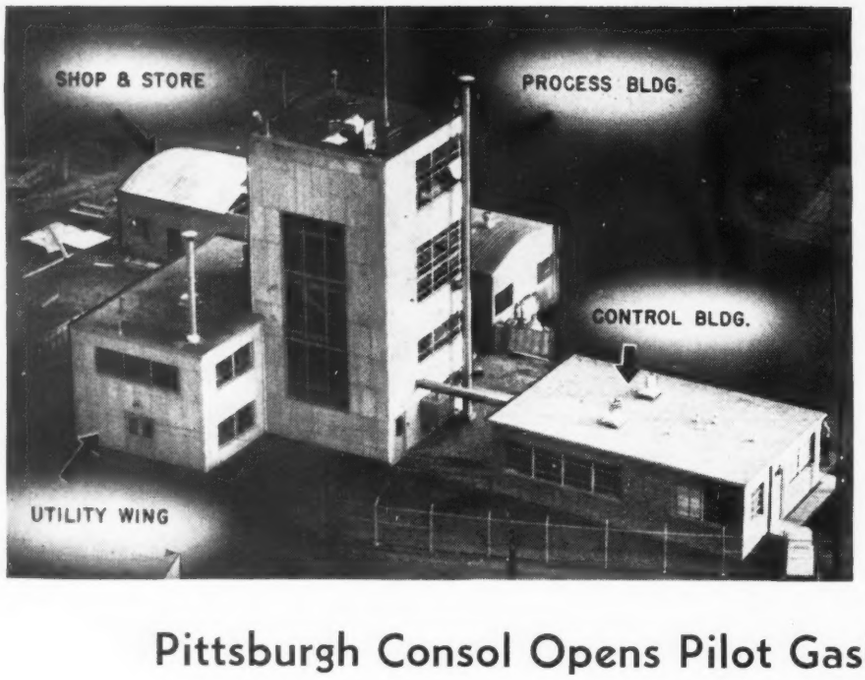
Bituminous Coal Wages Still Top 158 Groups

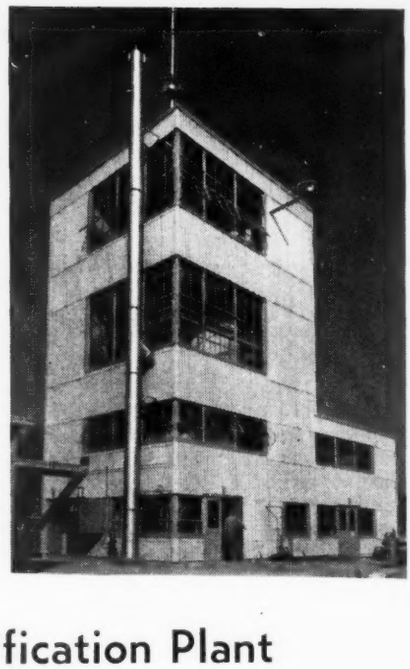
Average weekly earnings for bituminous coal miners in August, the first full month under the current contract, were $77.87, according to the U. S. Bureau of Labor Statistics. This figure was the highest rate of the 158 industries recorded by the Bureau and compares, for example, with the $54.12 average for all manufacturing industries. The bituminous miner averaged $1.98 an hour, with a work week of 39.3 hours.



Community Receives Powhatan Athletic Stadium

HENRY G. SCHMIDT, president, Powhatan Mining Co., speaking at the ceremonies marking the formal presentation Oct. 30 of the new high school athletic field built by the company for the Powhatan Point, Ohio, community. Reportedly costing upwards of $50,000, the field covers six acres, has steel grandstands seating 2,000 and features the latest in athletic field equipment (Coal Age, November, p. 130). It was built under the direct supervision of Roy W. Fox, general superintendent of the company, assisted by C. G. Evans, safety director. A. J. Ruffini, vice president of operations, participated with Mr. Schmidt in turning over the deed to the field to the Board of Education.





Pittsburgh Consol Opens Pilot Gasification Plant

THE NEW PILOT PLANT for the gasification of coal built by the Pittsburgh Consolidation Coal Co. in cooperation with the Standard Oil Development Co. at a cost of $500,000 was formally opened Nov. 15 with an inspection tour by more than 40 top officials of railroads, power and coal companies and the U.M.W.A., accompanied by Pittsburgh Consol directors and officers. Later in the day, the group visited the company's enlarged and modernized Arkwright mine near Morgantown, W. Va.

Included in the plant, as shown in the aerial view (left), is a separate control building, a process building and a combination shop and storeroom. The process building (right) houses the generator and has five platform levels to permit full access to the unit and its auxiliary equipment.

Purpose of the plant, according to company officials, is to study operability of fluidized coal gasification to reach conclusions regarding costs and commercial design. Gasification is accomplished by the reaction of steam and oxygen with fluidized coal (or char) at a high temperature. The product is a mixture of carbon monoxide and hydrogen known as water gas, or "synthesis gas." Produced commercially, this gas may be sold for low-B.t.u-fuel uses or for metallurgical purposes, may be enriched to the equivalent of manufactured city gas or may be fed to a Fischer-Tropsch synthesis reactor for the production of gasoline and chemicals. In addition to the pilot plant, the company's other research facilities at Library are being used for study of gasification. Work on coal carbonization and tar processing is being carried on at both Library and Imperial, Pa.

In commenting on the company's gasification program, George H. Love, president, said: "At present there is no apparent economic justification for investment of large sums in commercial facilities to convert coal into gasoline. But we must anticipate that the time will come when such conversions will be commercially justified or necessary in the national interest. While growing energy demands are expected to increase the use of coal in solid form, the establishment of new uses will add security to the industry's future. These things—to be ready for a national need, and to establish new markets for coal—are the objectives of our research, which we can't leave for others to do."

At the company's Arkwright mine, the inspecting group was first shown the new preparation plant and combination rail, river and truck tipple. When the nearby Osage mine is connected with the Arkwright mine by the proposed underground haulageway, the new plant will clean and size their combined daily output of 12,000 tons on a three-shift operation.

Coal and Business Activity

		1948 to This Date	1948 Over 1947, to Date
Est. anthracite prod., wk. ending Nov. 6	863 000	48,736,000	—0.4%
Est. bituminous prod., wk. ending Nov. 6	10,240,000	496,211,000	—5.7%

Source: U. S. Bureau of Mines.

	Bituminous Coal Stocks (Thousands, net tons)				Consumption (Thousands, net tons)		
	Oct. 1, 1948	Day's Supply	Sept. 1, 1948	Oct. 1, 1947	Sept., 1948	Aug., 1948	Sept., 1947
Electric power utilities	22,751	83	21,107	15,164	8,272	8,203	7 616
Byproduct coke ovens	10,968	40	10,289	6,216	8,199	8,349	7,658
Beehive coke ovens	†	†	†	†	921	960	891
Steel and rolling mills	1,152	50	1,166	1,089	697	706	741
Cement mills	1,369	60	1,328	909	679	719	662
Other industrials	19,619	57	18,810	15,758	10,247	10.066	8,739
Railroads (Class I)	8,815	36	8,685	6,227	7,258	7,467	8,450
Retail dealers	2,918	14	2,672	2,017	6,156‡	5,496‡	7,036‡
Total	67,592	48	64,057	48,270	42,429	41,966	41,793

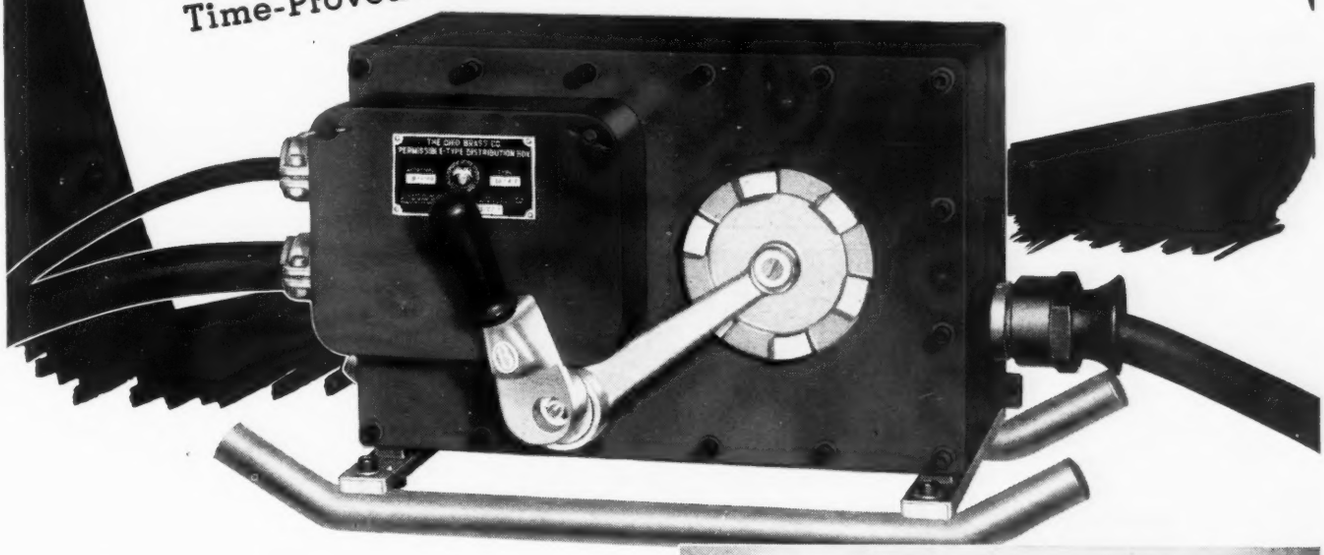
Source: U. S. Bureau of Mines. †Not available. ‡Retail dealer deliveries.

	Latest Week*	Month Ago	Year Ago
Business Week Index of Business Activity, wk. ending Nov. 13	197.7	196.7	189.9
Steel ingot operations (% of capacity)	99.0	99.1	97.0
Electric power output (million kw.-hr.)	5,571	5,482	5,084
Crude oil production (daily avg., 1,000 bbl.)	5,626	5,586	5,257
Misc. & L.C.L. carloadings (daily avg., 1,000 cars)	90	90	89
All other carloadings (daily avg., 1,000 cars)	64	62	63
Prices, spot commodity index (Moody's, Dec. 31, 1931 = 100)	398.8	405.5	448.2
Prices, industrial raw materials (B.L.S., Aug., 1939 = 100)	279.7	275.6	292.1
Prices, domestic farm products (B.L.S., Aug., 1939 = 100)	317.6	326.2	396.7
Prices, finished steel composite (*Steel*, ton)	$95.05	$95.05	$76.09
90 stocks, price index (Standard & Poor's Corp.)	120.6	128.7	120.9

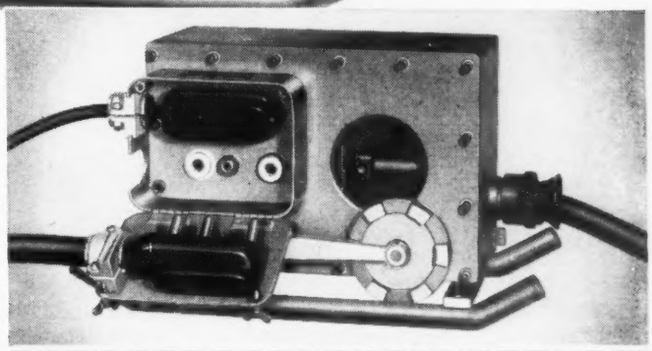
*Date of latest week for each series on request.

O-B Announces New 2-Circuit Distribution Box ... the Type KG

- Mine-Engineered to Your Requirements, the Type KG Follows the Same General Design and Includes the Same Time-Proved Features of the O-B Type-LG 3-Circuit Box.



- Approved by U. S. Bureau of Mines
- Weighs but 150 Pounds
- Overall height 14⅜ inches
- Send Coupon today for free Descriptive Booklet



Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

OHIO BRASS COMPANY MANSFIELD, OHIO

I'd like some more information on the new Two-Circuit Permissible Distribution Box. Please send me a copy of Booklet 838M.

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Philadelphia Bank Exhibits Anthratube

ANTHRATUBE EXHIBIT in the lobby of the First National Bank of Philadelphia, arranged by the local office of the Anthracite Institute in connection with Pennsylvania Week, is viewed by Creighton Stewart (left), radio commentator, and Edward H. Walker, vice president in charge of public relations for the Institute. Literature on the unit was made available to an estimated 25,000 visitors passing the exhibit and inquiries were referred to the Institute. As a part of the current promotion of the anthratube, Mr. Walker was interviewed by Mr. Stewart over Station WCAU immediately after this picture was taken.

Motion Picture Features Anthracite Colliery

ONE SCENE from the new religious motion picture, "Salt of the Earth," produced for the United Lutheran Church in America by the Cathedral Films of Hollywood, with the cooperation of the officials and miners of the Morea, Pa., colliery of the Morea-New Boston Breaker Corp. and the residents of four surrounding towns. Following a week's filming of surface and underground shots at the mine and in the nearby communities, which included action by a score of Morea miners, the film was completed in Hollywood with a group of 50 professional actors, using sets constructed there to duplicate a part of the Morea buildings and underground tunnels.

The picture, which tells the story of what one man did when he decided to take the Christian religion seriously, is to be shown in churches throughout the country. For the benefit of those in the mining communities who cooperated in its production, a special premiere of the film was held Oct. 28-29 at a motion picture theatre in Port Carbon, Pa.

N.C.A. Sends Members "No Accidents" Flag

A "No Accidents" pennant designed to be flown by member mines each month as long as no compensable accident occurs at the operation was issued late in October to safety directors of bituminous coal companies by Earl R. Maize, director, safety division, National Coal Association. The flag, which was originated as a symbol of the coal industry's cooperation in the campaign to reduce accidents, is to be raised on the first of each month and will remain flying until a compensable accident should occur, when it will be lowered until the first of following month.

With the flag, the safety directors received copies of the poster reproduced above, which will be placed on bulletin boards to explain and dramatize to miners the purpose of the pennant.

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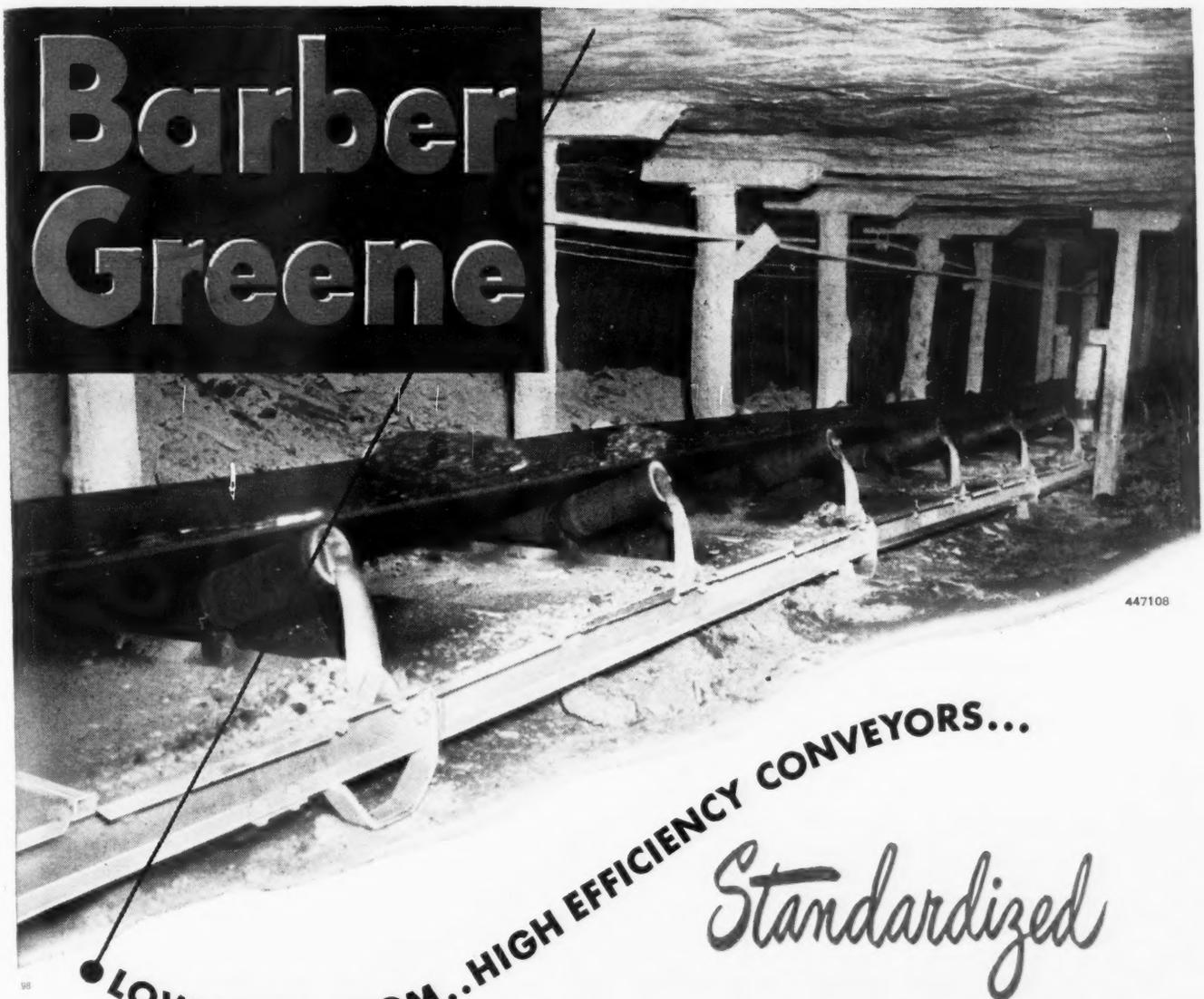
Washington Coal Group Seeks Gasification Plant

The 1949 Washington state legislature will be asked by the Coal Producers Association of that state to allocate funds for establishing and operating a pilot plant to convert coal to gas, according to James E. Ash, association secretary. The request will be for allocation of funds to the mines bureau through the University of Washington.

Plans call for a plant with either a 3-ft. 3-in. or 5-ft. generator, costing $150,000 or $350,000, respectively. Operation and maintenance cost over a two-year period, if the plant were located on property of the Seattle Gas Co., is estimated at $120,000. The plant would run at least two weeks on each grade of coal, testing every available reserve of coal in the state. The cost of converting coal to gas, under the Lurgi process, is estimated at 80c per 1,000 B.t.u.

Barber Greene



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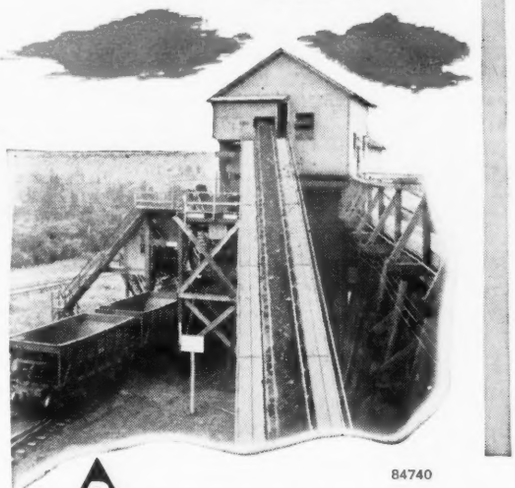
LOW HEADROOM..HIGH EFFICIENCY CONVEYORS...

Standardized

for easy assembly and relocation

You can cut the cost of getting the coal out of those low seams with simplified, "standardized" B-G channel-frame belt conveyors. These B-G *pre-engineered* underground conveyors come to you clearly marked for quick and easy assembly—are simply disassembled, relocated with a minimum loss of working time. Rugged channel frame has skid legs for low head room mounting on the floor, holds smooth rolling B-G Carriers in true alignment . . . To cut costs now, why not see your B-G Distributor about these widely used mine conveyors?



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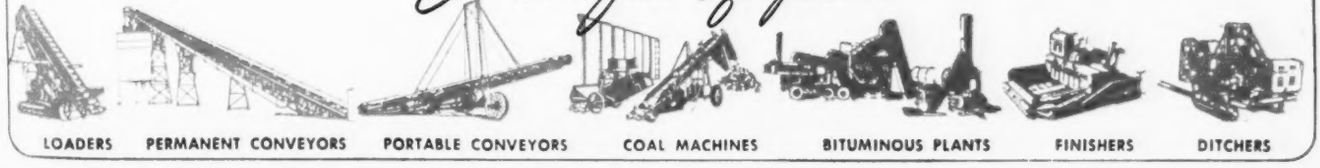
(Left) Less assembly time, less "blueprint work"—B-G Mine Conveyors (Channel or Truss Frame) with complete accessories—carriers, take-ups, drives, A-frames, etc.—are designed for maximum interchangeability, greatest ease in selection and erection. Assembly-tested at the factory!

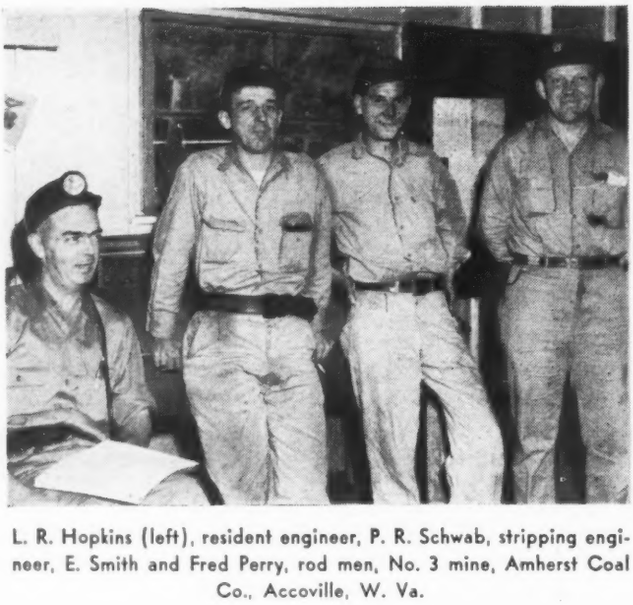
98

BARBER · GREENE COMPANY, AURORA, ILLINOIS

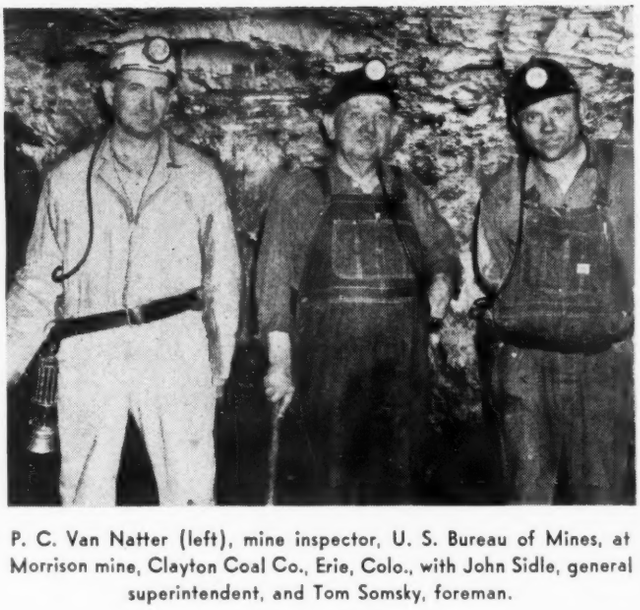
Constant flow Equipment



LOADERS PERMANENT CONVEYORS PORTABLE CONVEYORS COAL MACHINES BITUMINOUS PLANTS FINISHERS DITCHERS

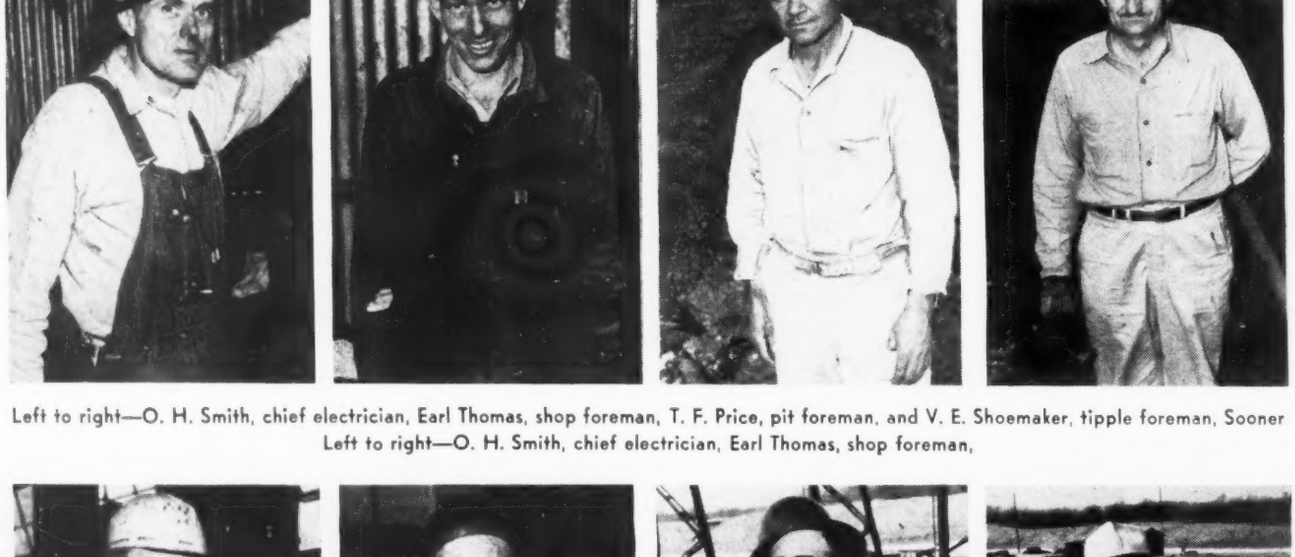


L. R. Hopkins (left), resident engineer, P. R. Schwab, stripping engineer, E. Smith and Fred Perry, rod men, No. 3 mine, Amherst Coal Co., Accoville, W. Va.



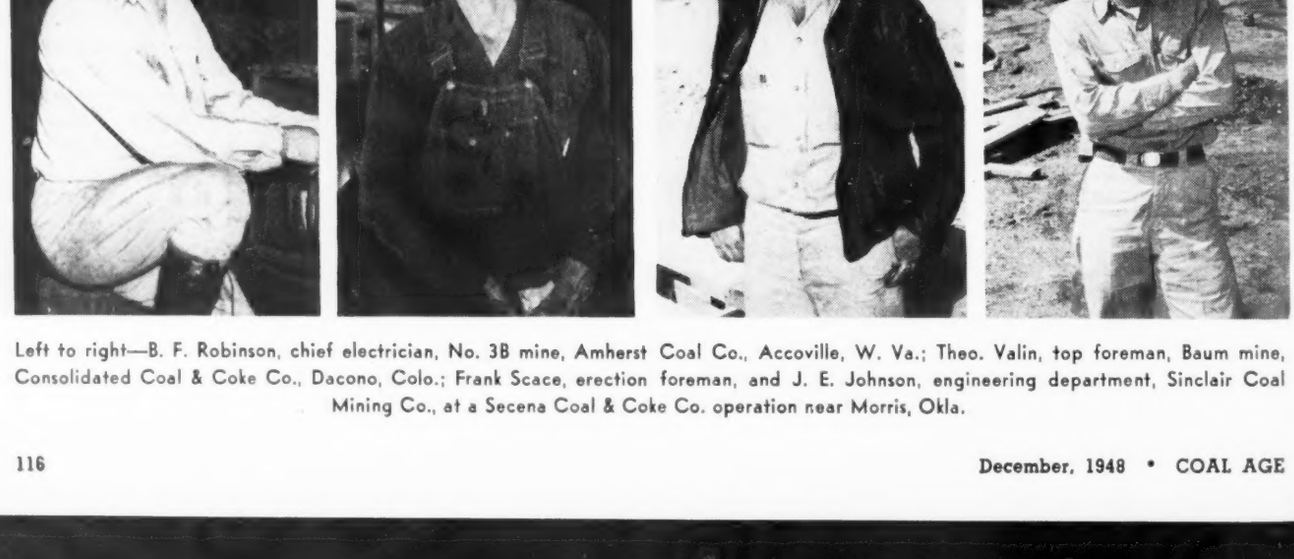
P. C. Van Natter (left), mine inspector, U. S. Bureau of Mines, at Morrison mine, Clayton Coal Co., Erie, Colo., with John Sidle, general superintendent, and Tom Somsky, foreman.

COAL MEN ON THE JOB



Left to right—O. H. Smith, chief electrician, Earl Thomas, shop foreman, T. F. Price, pit foreman, and V. E. Shoemaker, tipple foreman, Sooner

Left to right—O. H. Smith, chief electrician, Earl Thomas, shop foreman,



Left to right—B. F. Robinson, chief electrician, No. 3B mine, Amherst Coal Co., Accoville, W. Va.; Theo. Valin, top foreman, Baum mine, Consolidated Coal & Coke Co., Dacono, Colo.; Frank Scace, erection foreman, and J. E. Johnson, engineering department, Sinclair Coal Mining Co., at a Secena Coal & Coke Co. operation near Morris, Okla.

NICHOLAS T. CAMICIA (left), superintendent, Mud Fork Division, Island Creek Coal Co., and Mrs. Camicia are shown in the Netherlands Embassy with Col. R. Roos, military attache, who last month presented Mr. Camicia with a high military decoration of the Dutch government on direct orders of the Queen for the "active part" he played in the "liberation of the Netherlands." As a major in the U. S. Army, Mr. Camicia entered Holland with combat troops, and, after supervising the rehabilitation of the Dutch State Mines, remained for a year to direct their operation. Mr. Camicia was in military service, mostly overseas, for nearly five years and was previously awarded the U. S. Army's Bronze Star medal.

Personal Notes

Paul L. Shields has resigned as president, Sheridan-Wyoming Coal Co., Monarch, Wyo., to become president of the Spring Canyon Coal Co., Royal Coal Co. and Standard Coal, Inc., Salt Lake City, Utah. Before joining Sheridan-Wyoming last year, Mr. Shields, who is a member of the board of directors of the N.C.A., was vice president and general manager, U. S. Fuel Co., Salt Lake City. Mr. Shields succeeds Leonard E. Adams, who resigned as president of the three companies.

Walter J. Johnson has been named president, Sheridan-Wyoming Coal Co., to succeed Mr. Shields. Mr. Johnson was for some time general superintendent, Bell & Zoller Coal & Mining Co., Zeigler, Ill., and also was formerly associated with the Roundup Coal Mining Co., Roundup, Mont.

R. E. Henderson has been named general manager of stripping operations for the several companies associated with the Binkley Coal Co., St. Louis, Mo.

C. E. Haney, superintendent, Dorrance colliery, West Virginia Coal & Coke Corp., Stirrat, W. Va., has resigned to devote his entire time to church work. He now resides in Point Pleasant, W. Va., and has become pastor for a circuit of five churches in the area. **W. C. Adkins**, formerly general mine foreman, Mine No. 15, has been promoted to superintendent of the company's Micco No. 3 mine. **Rex Lawson**, formerly section foreman, Mine No. 15, has been made general mine foreman, to succeed Mr. Adkins. **Joe Kirk** has been advanced from assistant foreman to general mine foreman, No. 19-L mine. **Coy Frank Vincil** has been appointed section foreman at Mine No. 15.

DR. CHARLES J. POTTER, president, Rochester & Pittsburgh Coal Co., last month was made a "Commander of the British Empire" at ceremonies held at the British Embassy. The decoration is the highest honor that can be given to any non-British subject. Dr. Potter had also been previously honored by the United States for his outstanding wartime services in the Solid Fuels Administration and other agencies, receiving the Medal of Merit in May, 1946.

Norton Stone has been named secretary-treasurer and general manager, United Pocahontas Coal Co., Crumpler, W. Va., succeeding the late Harry C. Faust. Except for some years spent in the South Pacific during the war, Mr. Stone has been associated with the Virginia Bridge Co.

Henry (Red) Horner, formerly assistant mine foreman, has been advanced to mine foreman, Hill mine, Consolidation Coal Co. (Ky.), Pike County, Kentucky. **M. V. (Milt) Bentley**, assistant mine foreman at the company's Mine No. 204, Jenkins, Ky., has been appointed mine foreman at that mine. **B. B. Fritts** has been promoted from section foreman to assistant mine foreman at the Clover Splint mine in Harlan County.

Charles T. Holland, formerly professor of mining engineering, West Virginia University, has joined the mining engineering department of Virginia Polytechnic Institute, succeeding **L. L. Cothern**, who has been named head of the mining engineering department, Ohio State University.

The Island Creek Coal Co., Holden, W. Va., has announced several promotions among mine officials. **Ralph Thompson**, superintendent, Mine No. 24, has been made superintendent, Mine No. 7. **W. E. Pritchard**, formerly assistant superintendent, Mines Nos. 25 and 26, has been promoted to superintendent, Mine No. 24, succeeding Mr. Thompson. **Geelie Marcuzzi** has been advanced from mine foreman to superintendent, Mine No. 22. **Thurston Strunk** has been promoted from assistant superintendent to superintendent, Mine No. 23.

Other promotions and transfers previously reported at Island Creek include the following: **Milburn Hall**, assistant night foreman, Mine No. 23; **John B. Dardi**, section foreman, Mine No. 7; **John C. Hughes**, section foreman, and **William O. Mancos**, supply forman, Mine No. 26; **Robert D. Daughtery**, chief electrician, Mine No. 15; **John M. Skeans**, supply foreman, Mine No. 16; **Herbert Stapleton**, section foreman, and **Kenneth Mullins**, cleaner foreman, Mine No. 20; **Cliff Hutchenson**, supply foreman, Mine No. 23; **J. K. Wall** and **Greenway Mounts**, section inspectors, industrial engineering department. Men recently joining the company include: **Roy B. Williamson**, tipple foreman, Mine No. 25; **Raymond P. Lilly**, section foreman, Mine No. 15; and **J. W. Hatfield**, industrial engineer, industrial engineering department.

Promotion of four officials at the King mine, U. S. Fuel Co., Hiawatha,

high output at low cost

with dependable Sterling heavy duty motor trucks

The Correale Construction Company and its subsidiary Companies have been a consistant user of Sterling Motor Trucks for the past 15 years. This company has approximately 100 Sterling trucks of various heavy duty models in service on strip mining operations, showing that Sterling's offer the most in operating efficiency, resulting in repeat orders from its many satisfied customers. When you want high output at low operating cost, choose Sterling, the "Famous Name" of heavy duty motor trucks.

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branches and dealers in principal cities . . . .

Utah, has been announced by S. J. Craighead, vice president and general manager. **T. C. Jackson,** general mine foreman, has been advanced to general superintendent, succeeding **James McKim,** who resigned to become chief, coal and mining branch, ECA, with headquarters in Paris. **Russell Ramey,** formerly engineer, has been named assistant general superintendent. **James G. Reese Jr.,** has been promoted from preparation plant engineer to preparation plant superintendent. **Joseph Parmley,** general master mechanic, has been appointed maintenance superintendent.

William J. German, formerly general superintendent, Pocahontas Fuel Co., Inc., has been appointed by Gen. Clay to the chairmanship of the U. S. Coal Control Group in Germany. He will work in cooperation with the control group of the United Kingdom, in an effort to stimulate coal production in the Ruhr area. **Robert R. Estill,** former chairman of the group, is returning to the H. C. Frick Coke Co., with which he was associated before leaving for Germany last year.

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Association Activities

Kanawha Coal Operators' Association, at its annual meeting in Charleston, W. Va., Oct. 21, elected as president, D. W. Martin, president, Wyatt Coal Co. and MacAlpin Coal Co., Charleston, succeeding Garner Williams, vice president, Truax-Traer Coal Co. Other officers elected were: vice president, C. C. Dickinson, Jr., vice president, Dickinson Fuel Co.; treasurer, John L. Dickinson; and executive secretary, Harry G. Kennedy. Directors named for 1948-49 include: J. Earl Chamness, C. W. Connor, C. C. Dickinson, Jr., A. O'B. Hogue, F. O. Harris, Frank L. Hornickel, D. Holmes Morton, D. W. Martin, O. B. Pryor, W. F. Pioch, L. Newton Thomas and A. S. Wilson. A. W. Pollock was elected director emeritus.

Hazard Coal Operators' Association, at its 32nd annual meeting in Lexington, Ky., Nov. 11, re-elected as president, George P. Fitz, who has held that office for a number of years. C. Prewitt Gum was elected vice president and Lewis A. Hopper was named executive secretary. Named to the board of directors were: C. B. Jackson, Jr., J. E. Johnson, Jr., D. T. Mitchell, W. E. Davis, R. H. Kelly, F. M. Medaris, J. S. Trosper, M. K. Eblen and Mr. Gum.

A.I.M.E., announced at a meeting of the board of directors in New York, Nov. 17, the election as president for 1949 of Dr. Lewis E. Young, consulting engineer, Pittsburgh, Pa. Dr. Young, who will formally take office at the annual meeting in San Francisco in February, was vice president of the Pittsburgh Coal Co., from 1927 to 1939. E. R. Price, general superintendent of mines, Inland Steel Co., Wheelwright, Ky., chairman of the coal division for 1949, was elected a director ex officio.

Moshannon Coal Mining Institute, at a banquet last month in Altoona, Pa., marking the 25th anniversary of the organization, elected as president, Francis E. Schroyer, state mine inspector, Dubois, Pa., to succeed Walter Williams, Ramey, Pa. Other officers named were: first vice president, J. B. Stoddart, Robertsdale; second vice president, John Foreman, Cresson; third vice president, John Helman, Coalport; secretary-treasurer, Thomas F. Morgan, Philipsburg; and assistant secretary-treasurer, Robert J. Emeigh, Philipsburg. Appointed to the executive board were: Arthur Dukes, Cresson; John W. Gray, Winburne; Harry Adams, Houtzdale; David B. Millward, Philipsburg; and Richard E. George, Altoona.

Greenbrier Coal Operators' Association has named Harold Yates secretary of the association.

Illinois Coal Strippers' Association has moved its offices to new quarters in Room 1514, Bell Bldg., 307 North Michigan Ave., Chicago 1.

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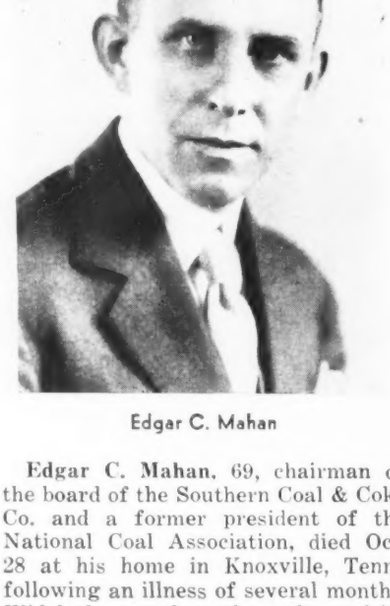
Obituaries



Edgar C. Mahan

Edgar C. Mahan, 69, chairman of the board of the Southern Coal & Coke Co. and a former president of the National Coal Association, died Oct. 28 at his home in Knoxville, Tenn., following an illness of several months. Widely known throughout the coal industry, Mr. Mahan had been connected with a number of coal companies and other business organizations and was active in furthering the work of civic and church organizations in the community. He was one of the founders of the Southern Coal & Coke Co. in 1902, serving as general manager of the company until he became president in 1918. He also was a past president of the Southern Appalachian Coal Operators' Association.

Henry T. DeBardeleben, 74, chairman of the board, DeBardeleben Coal Corp., died Nov. 2 at his home in Birmingham, Ala. Mr. DeBardeleben had been associated with the coal industry for more than 50 years and was highly regarded by his many associates. He had served for many years as a member of the board of directors of the N.C.A. and at the time of his death was a director of B.C.I.

George L. Smith, 56, former vice president of operations, Rochester & Pittsburgh Coal Co., Indiana, Pa., died Oct. 17, in the Mercy Hospital, Pittsburgh. Mr. Smith had been in poor health for several years.

James O. Watts, 67, secretary and treasurer, Gulf Smokeless Coal Co., Tams, W. Va., died Oct. 21 at White Sulphur Springs, W. Va., following a heart attack.

Andrew M. Hanna, 64, president, Mackie Clemens Coal Co., Kansas City, and vice president, Clemens Coal Co., Pittsburg, Kan., died Oct. 29, at St. Luke's hospital, Kansas City, Mo., following an illness of several months. Mr. Hanna first became active in the coal industry of the section as a young man. He was one of the organizers of the Mackie Clemens company in 1911, becoming president in 1932. Mr. Hanna served on various governmental coal boards during both world wars.

Edward L. Carr, for many years assistant to the president, Bell & Zoller Coal & Mining Co., Chicago, and a vice president of the company when he retired some years ago, died Nov. 11 at his home. Mr. Carr was for several years chairman of the board of District 10, in addition to his association with Bell & Zoller.

William Crichton, Jr., of Charleston, W. Va., vice president, Johnstown Coal & Coke Co., died Oct. 29, following a heart attack. He was a member of the board of directors of the Southern Coal Producers' Association and was president of the Greenbrier Coal Operators' Association, having recently relinquished his position as secretary of the association, which he had held for many years.

Edwin Jones, 79, who retired last March as superintendent, Mine No. 4, West Virginia Coal & Coke Corp., Omar, W. Va., died Oct. 10 at his home in Barnabus, W. Va. Mr. Jones started to work in the mines in 1881 in Wales, coming to America in 1887. He joined West Virginia Coal & Coke in 1927 as an inspector and had served as superintendent of the company's Earling mine for 12 years before transferring to Mine No. 4.

One P&H after another

These two P&H Model 1400 Electric Shovels (4 cu. yard capacity) team up in this open pit mine at Tahawus, New York for the National Lead Company.

Yes, the new P&H Electric Shovels are following each other quickly these days — in one location after another. You'll find the reasons for it in P&H's Added Values.

"Magnetron" control is a typical example. Here, through the ingenious use of a proven magnetic principle within the controllers themselves, P&H has achieved stepless power regulation — smoother than you've ever known — for all motions in crowd, hoist, swing, and propel. What's more, multiple electrical contacts, resistor panels and separate exciters are entirely eliminated. And there are no terrific electrical surges to invite burn-outs and trouble.

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Winning Teams From Six Districts Compete as . . .

KENTUCKY STATE FIRST AID CHAMPIONS in the white division was this team (left) from Mine No. 214, Consolidation Coal Co. (Ky.), pictured with V. D. Picklesimer, general superintendent, South-East Coal Co., at the right, who presented awards to the winners of the two-day event. Winners of the first aid competition in the colored division was the team (right) from the Leckie Collieries Co., Aflex, Ky.

CHAMPIONS IN MINE RESCUE was the team from the Republic mine of the Republic Steel Corp. (left). Display of the new mine rescue truck recently delivered to the Kentucky Department of Mines and Minerals (right) also was a feature of the meet. Two additional trucks are on order, according to A. D. Sisk, chief of the department, who stands at the right of the truck.

Kentucky Champions Picked in Safety Meet

Taking top honors in a state-wide first aid and mine rescue contest held at Middlesboro, Oct. 15-16, the team from Mine No. 214, Consolidation Coal Co. (Ky.), McRoberts, captained by Warnie Flint, became the Kentucky state first aid champions, in the white division. Participating in the competition were the first- and second place winners in the white first aid division, winning colored first aid teams and top-ranking mine rescue teams determined in district contests previously held by the Western Kentucky, Pond Creek-Tug River, Big Sandy-Elkhorn, Kentucky River, Harlan, and Cumberland Valley Mining Institutes.

Prizes awarded the winning Consol team included a team cup and individual cups for each member donated by the National Coal Association. The formal presentation of these and other prizes awarded in the two-day event was made by V. D. Picklesimer, general superintendent, South-East Coal Co., Seco, Ky.

First place in the first aid contest, colored division, was won by the team from the Leckie Collieries Co., Aflex, Ky., captained by James Miles. Trophy for this event was a cup donated by the Mine Safety Appliances Co.

In the mine rescue competition, the team from the Republic mine, Republic Steel Corp., Pike County, captained by Eddie Rowe, took first place and received a cup awarded by the Mine Safety Appliances Co. Second place in the first aid contest, white division, brought a cup donated by the Bituminous Casualty Corp. to the team from the Pond Creek Collieries, South Williamson, captained by Bogar Bevias. Winners of third place in this event, the Path Fork team of the Blue Diamond Coal Co., captained by T. E. Simpson, received a cup donated by the Coal Operators' Casualty Co.

Serving on the committee for the state-wide contest, along with A. D. Sisk, chief, Kentucky Department of Mines and Minerals, were: C. D. McDowell, E. A. Starling, Thomas O. Long, J. H. Mosgrove, Ira A. Inman and Robert Dickson. Directors of the meet were: A. D. Sisk, C. A. Herbert, A. U. Miller, M. C. McCall and A. O. Moss. Officiating as supervisors were W. R. Park and Grady Reid, and as chief judges, G. W. Groves and W. J. Fene, all of the U. S. Bureau of Mines.

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AMERICAN offers you explosives to exactly fill every one of your blasting requirements. Prompt deliveries, too. It always pays to specify AMERICAN explosives and blasting accessories.

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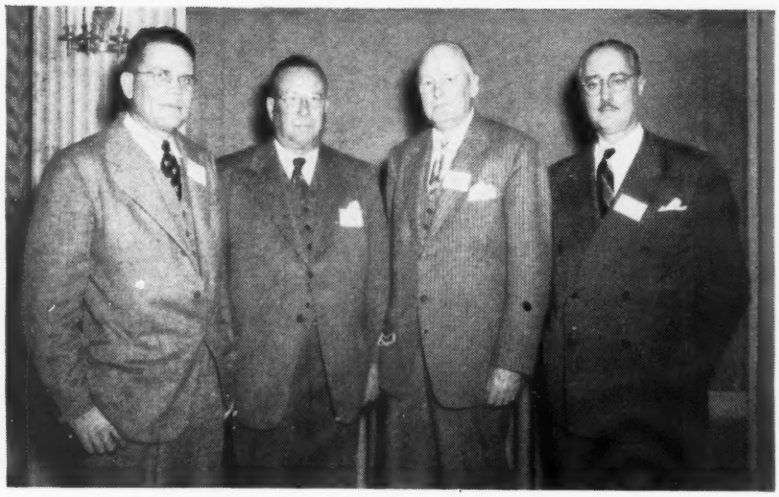
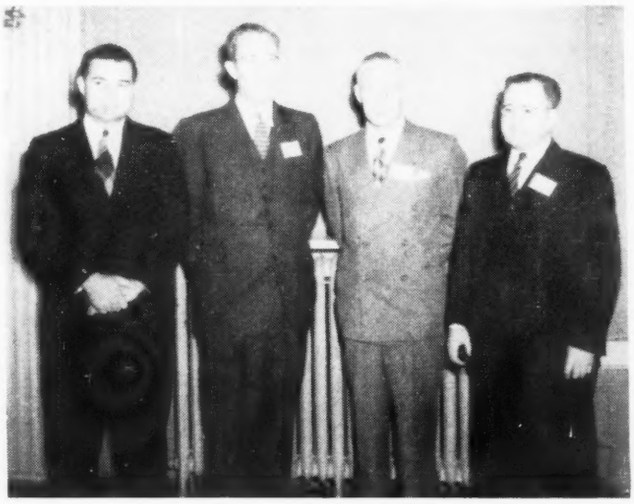


AT ILLINOIS MINING INSTITUTE MEETING—Left photo: B. E. Schonthal (left), secretary-treasurer, and Harry M. Moses, retiring president, of the Institute. Right photo: H. L. Walker (left), University of Illinois; Harry M. Moses, H. C. Frick Coke Co.; George F. Campbell, Old Ben Coal Corp.; and Henry C. Woods, Sahara Coal Co.

MORNING SESSION SPEAKERS—John Wilson (left), Union Collieries Co.; William C. McCulloch, Roberts & Schaefer Co.; J. W. MacDonald, Old Ben, chairman; and Laning Dress, Binkley Coal Co.



AFTERNOON SPEAKERS—W. J. Jenkins II (left), session chairman, Consolidated Coal Co.; E. T. Groat, Kelso-Burnett Electric Co.; E. M. Arentzen, Lee-Norse Co.; and C. C. Conway, Consolidated Coal Co.

Illinois Institute Holds 56th Annual Meet

COAL PREPARATION, power distribution, equipment servicing, roof control and mining education were the technical topics stressed at the 56th annual meeting of the Illinois Mining Institute, Hotel Abraham Lincoln, Springfield, Ill., Nov. 5. About 650 attended the day-long meeting presided over by Harry M. Moses, president. At the evening session special honorary life certificates were presented to J. W. Starks, Peabody Coal Co., and Dr. L. E. Young, consulting engineer, Pittsburgh, Pa. Speaker at the banquet was Strickland Gillilan, whose subject was "Washington—America's Human Crucible."

The technical papers presented at the morning session were prepared and sponsored by the eight-year-old Illinois Society of Coal Preparation Engineers and Chemists, Benton, Ill. J. W. MacDonald, Old Ben Coal Corp., presided as session chairman.

The McNally-Carpenter centrifugal dryer is doing a highly acceptable job on a 10-meshx½-mm. feed at Union Collieries Co. No. 2 Kathleen mine, DuQuoin, Ill., stated John Wilson in his paper on centrifugal drying. This continuous centrifugal dryer is used for reducing moisture of coal having a top size of ⅜-in. and under. It performs best, however, when the feed has a top size approaching the largest size that the dryer is equipped to handle.

The principal disadvantage of the dryer, said Mr. Wilson, is the relatively short screen life and consequent maintenance and replacement costs. A study of the worn screens has shown that most of the wear results from the abrasive fines passing through the screen rather than the abrasive action of the bed moving over them. Carrying a heavy bed on the screens as a filter for the fines appears to help, but this also tends to retard drying and reduces the slight beneficiation which is usually evident

(*Continued on page 154*)

1949 Officers Illinois Mining Institute

President—J. Roy Browning, Illinois Coal Operators Association.

Vice President—T. G. Gerow, executive vice president, Truax-Traer Coal Co.

Secretary-Treasurer—B. E. Schonthal, B. E. Schonthal & Co., Inc.

Newly elected to the executive board (three-year terms) were: George F. Campbell, president, Old Ben Coal Corp.; Fred S. Pfahler, president, Superior Coal Co.; W. J. Jenkins, president, Consolidated Coal Co.; and H. H. Taylor, president, Franklin County Coal Co.

Rome 60

MINING CABLES

(NEOPRENE SHEATHED...CURED IN LEAD)

GROUNDED and FLAME PROTECTED

For Safety

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RESISTANCE TO ACIDULOUS MINE WATERS
RESISTANCE TO ABRASION
UNIFORM DIAMETERS
SUPERIOR QUALITY

Look for "Appro. No. 105" Molded in the Neoprene jacket—it is your assurance of approval under Federal and State of Pennsylvania Safety Codes.

ROME 60 MINING CABLES ARE AVAILABLE AS:

Single Conductor Locomotive

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With or Without Ground Wire

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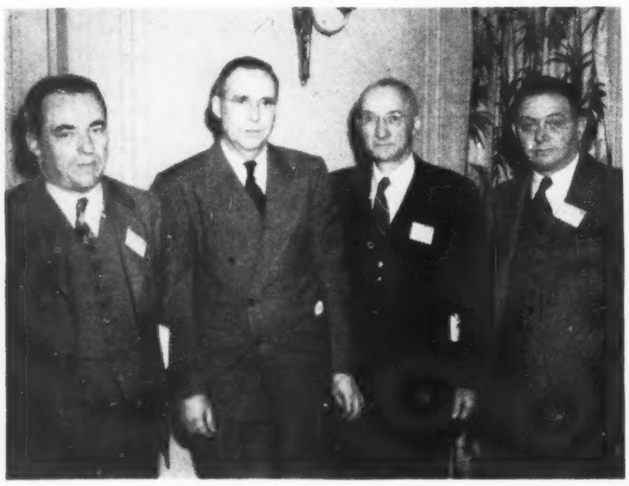
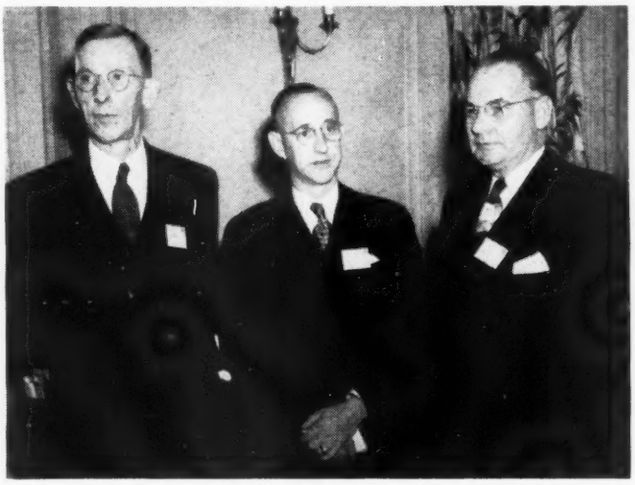
SECTION OFFICERS AND HAULAGE SAFETY SPEAKERS—K. K. Kincell (left), superintendent, Mine No. 63, Consolidation Coal Co. (W. Va.); W. J. Schuster, safety director, Hanna Coal Co.; J. H. Hansford, director, Mine Safety and Rescue, West Virginia Department of Mines; C. R. Stahl, assistant operations vice president, Eastern Gas & Fuel Associates, and new general chairman, Coal Mining Section; John T. Ryan, Jr., executive vice president, Mine Safety Appliances Co., and retiring general chairman, Coal Mining Section; and W. D. Northover, safety director, Rochester & Pittsburgh Coal Co.



ROOF SAFETY SPEAKERS—Edward Thomas (left), mining engineer, U. S. Bureau of Mines; T. C. Higgins, U. S. Bureau of Mines; A. R. Harris, safety engineer, P. & R. C. & I. Co.; and George H. Sambrook, safety director, H. C. Frick Coke Co.



SPEAKERS ON MAKING SAFETY WORK—J. D. Cooner (left), safety engineer, The Hudson Coal Co.; Earl Maize, director, Safety Division, National Coal Association; and Paul K. Reed, international representative, United Mine Workers of America.

Roof and Haulage Safety Stressed at National Council Meet

"AM I DOING ALL I CAN to make my operations safe for the men who work for my company?" That was the challenge issued to more than 100 coal-mine safety engineers and others who attended meetings of the Coal Mining Section, National Safety Council, in Chicago, Oct. 18-20. To guide the section in the year ahead, the following officers were elected: chairman—C. R. Stahl, assistant operations vice president, Eastern Gas & Fuel Associates, Mt. Hope, W. Va., succeeding John T. Ryan, Jr., executive vice president, Mine Safety Appliances Co., Pittsburgh, Pa.; vice chairmen—George Roos, general manager, The Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.; and Arthur Bradbury, safety engineer, Inland Steel Co., Wheelwright, Ky.; and secretary—H. J. Sloman, U. S. Bureau of Mines, Pittsburgh.

Leading off a series of addresses on haulage and haulage equipment at the opening session, W. D. Northover, safety director, Rochester & Pittsburgh Coal Co., Indiana, Pa., told the group that discipline is the biggest factor in prevention of haulage accidents. Company records show that 90 percent of accidents to mine workers are caused by improper attitude, taking unnecessary chances and failure to follow safe procedures that have been taught, he said. Since the working place already is as safe as it is practicable to make it, advances in safety from now on will be made among the human factors that cause 90 percent of our accidents, he argued.

The first step in achieving discipline among miners, Mr. Northover declared, is to persuade them that either (1) they must discipline themselves, or (2) the boss will discipline them, or (3) circumstances will discipline them. In the last case, when circumstances take over, an accident is the disciplinary agent, he pointed out.

Citing the ease with which physical hazards can be spotted and corrected and declaring that 97 percent of the accidents that occurred at one of his company's mines could have happened just as easily at the victim's home or on the street, Mr. Northover contended that discipline in safe work habits is the answer to the industry's accident problem.

Proper discipline can be obtained by applying the necessary penalty

(Continued on page 166)

How to choose a mine conveyor

1 Buy it like you do a refrigerator

When you buy a refrigerator, you get a completely engineered unit. You don't buy the compressor one place and the cabinet another. Follow that same principle when you buy a mine conveyor. Buy the conveyor machinery from the same source that supplies you with the belting.

2 Depend on one source for everything

Like your refrigerator's compressor and cabinet, your conveyor's machinery and belting must be engineered to work together. So, get *both elements* from the same manufacturer. Insist on undivided responsibility for the whole job. Your entire conveyor will last longer . . . work better.

3 Specify Hewitt-Robins Mine Conveyors

The Hewitt-Robins Mine Conveyor is the *only* one you can buy as a complete "package." You get machinery and belting engineered as a unit . . . and installed by Hewitt-Robins service engineers. In fact, Hewitt-Robins is the *only* company that offers you this undivided responsibility.

4 Remember this fact—

A Hewitt-Robins Mine Conveyor lasts longer . . . for it is the only one engineered, manufactured, and installed as a complete unit.

What's more, it's carried in stock for immediate delivery at Passaic, N. J. and Charleston, W. Va. Call on us for information about Hewitt-Robins Mine Conveyors. Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N. Y.—or Robins Conveyors Division, Passaic, N. J.

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OFFICIATING AT JOINT A.I.M.E.-A.S.M.E. MEETING—G. G. Ritchie (left), co-chairman, and A. W. Thorson, general chairman, Joint Fuels Conference committee; R. H. Morris, co-chairman, and C. E. Lawall, chairman, general arrangements committee.

Varied Topics Discussed at Joint Fuels Conference

COAL AND SYNTHETIC FUELS, mechanical mining in Europe, evaluation of domestic stoker coals, stoker-performance correlation with petrographic composition, coking properties, organizing research and coal handling at the head of the Lakes, were subjects featured at the eleventh Joint Fuels Conference of the A.I.M.E., Coal Division, and the A.S.M.E., Fuels Division, held at the Greenbrier Hotel, White Sulphur Springs, W. Va., Nov. 3-4.

At the banquet with Dr. C. E. Lawall, assistant vice president, C. & O. Ry., presiding as toastmaster, the Percy Nicholls award of 1948 was presented to Ralph A. Sherman, assistant director, Battelle Memorial Institute. As the speaker for the evening, E. G. Bailey, president, A.S.M.E., discussed "Engineers' Opportunities in the Field of Fuels." At a luncheon, Carl E. Miller, technical advisor, Battelle Memorial Institute, reported on coal utilization in Europe.

Analyses, evaluation tests and follow-up data on experience in marketing for 33 coals were presented by Harlan W. Nelson, supervisor, and James B. Purdy, research engineer, Battelle Memorial Institute, in a paper, "An Evaluation of Residential Stoker Coals."

Of the group, the laboratory listed 20 as satisfactory, six as unsatisfactory and seven as limited or on borderline for the purpose. The laboratory method, developed 12 years ago, consists of burning each type of coal for five days in a residential-type stoker and furnace mounted on a platform scale so that combustion-rate losses can be measured.

The main factors constituting the basis for evaluation are: initial ignition, clinker formation, coke formation, rate of fuel consumption during hold-fire operation, resistance of fuel bed to flow of air, uniformity of burning during intermittent operation and smoke concentration. No correlation was found between the percentage of clinker in total ash removed as plotted against the ash softening temperature. A poor correlation was indicated between the clinker percentage and proximate analysis determination of ash in the coal. A relation between free-swelling index and weight of coke formed was definitely indicated but did not correlate closely. Few direct relationships had been found between laboratory test data and the evaluations made by burning in the laboratory test furnace, the paper pointed out.

In the discussion, L. A. Shipman, fuel engineer, Southern Coal & Coke Co., said that field experience had proved the correctness of a laboratory evaluation of a certain coal as being on the borderline in ignition characteristics.

Coal is by far the leading potential source of raw material for production of liquid fuels, said J. D. Doherty, U. S. Bureau of Mines, in his paper, "Coal and Synthetic Liquid Fuels." Oil shales are distant from the leading markets and, as was pointed out in the discussion following, oil made from shale has many undesirable characteristics. Since it is impractical to curtail the consumption of oil and unwise to depend for long on increased imports, new sources of oil, such as synthetic fuels, must be developed.

To meet anticipated increases in consumption of liquid fuel, it has been suggested that plants be built in the next 10 years to produce 2,000,000 barrels of synthetic oil per day, Mr. Doherty reported. Assuming that half of this would be made from coal, the coal required would total 210,000,000 tons per year. Estimated costs of liquid fuels of various types ranging from heavy oil to aviation gasoline, all made from coal by the gas synthesis and hydrogenation processes, range from 10 to 15c. per gallon. Those costs do not include return on investment, such as interest or profit.

Although high-ash coal can be gasified, it appears likely that coal cleaning and drying will be required to reduce ash, control moisture and secure uniformity. Shortage of water may limit the size and number of synthetic plants located in the western states. Mr. Doherty presented considerable detail on the whole question of the use of coal for synthetic fuels and suggested that there was an immediate need for prompt action in building a few commercial plants.

G. R. Spindler, head, West Virginia School of Mines, drawing on his recent experience as European technical adviser, Joy Manufacturing Co., predicted that longwall mining will continue to predominate in Europe, in his paper, "Mechanical Mining in Europe." If modern room-and-pillar mining is installed where geologic conditions permit, however, it will yield greater efficiency and productivity than are possible with longwall methods, he stated. Conveyors are widely used in European mines, but power loading is a relatively new effort and is a principal interest in the present and future mechanization of the mines.

Rope haulage is used widely only in England and there it is being replaced as rapidly as suitable locomotive haulageways can be constructed. Locomotives are generally used in other European countries and the trend is toward trolley units. Next in order of preference are diesel, compressed-air and storage-battery locomotives. A number of new mobile-loader and shuttle-car units in Czechoslovakia seem assured of success and in the French part of the Saar Joy loading machines working with chain conveyors and American belts are operating satisfactorily on gradients up to 15 percent, he reported.

Mr. Spindler showed photographs and discussed production rates of some of the longwall loaders used in Europe, including Huwood, Shelton,

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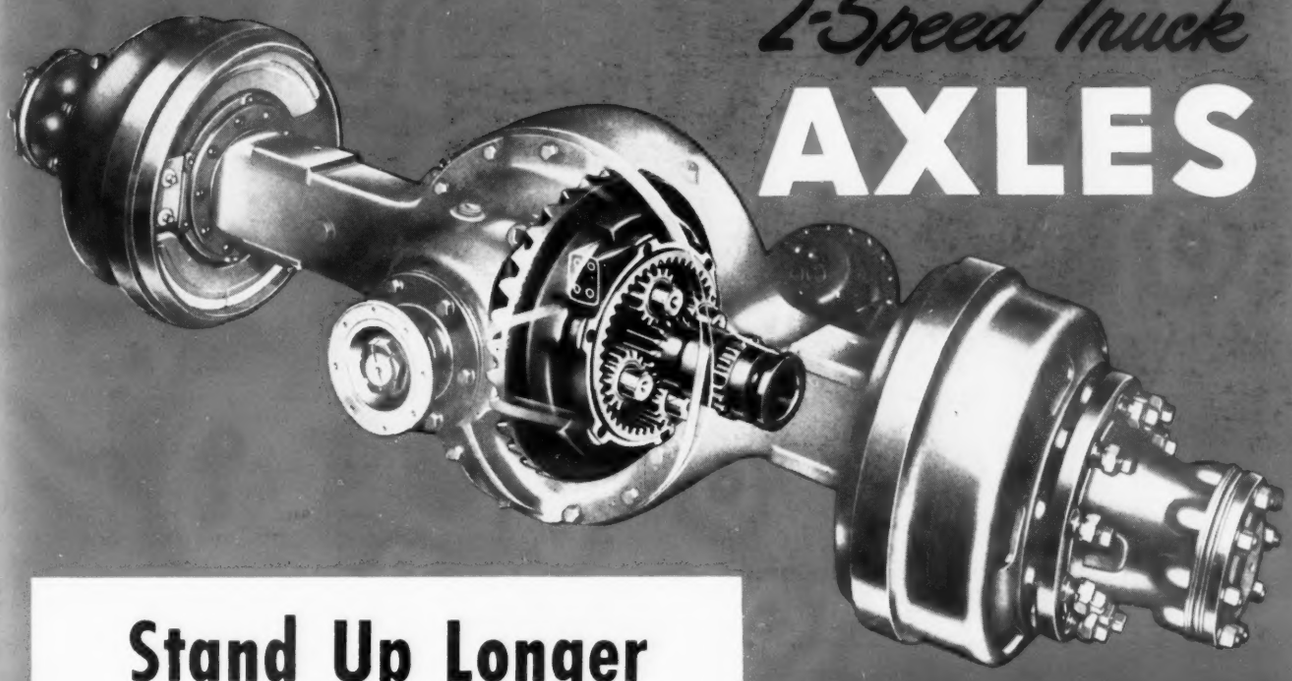

Stand Up Longer *Because*

- ☆ **They are Engineered to the Truck**
- ☆ **Tooth Load is Distributed Over 4 Planetary Pinions**
- ☆ **Lubrication Starts the Instant Gears Turn Over**
- ☆ **Planetary Construction Results in Minimum Wear**
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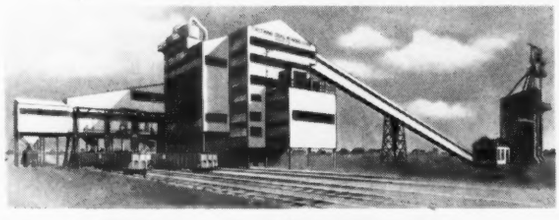

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For washing coarse coal R & S HYDRO-SEPARATOR Bulletin No. 171

For washing fine coal R & S HYDROTATOR Bulletin No. 166

EQUIPMENT APPROVAL

One approval of permissible equipment was issued by the U. S. Bureau of Mines in October, as follows:

Jeffrey Mfg. Co.—Type 56-HR drilling machine; one motor, 10 hp., 500 volts, d.c.; Approval No. 2-636A; Oct. 13.

No approvals were issued during the month of September.

Joy longwall loader, Meco-Moore cutter-loader and the German coal plow. The latter, used mostly in the Ruhr but to some extent in Holland and Belgium, is an excellent mining device, Mr. Spindler said, where the following suitable conditions are present: (1) soft coal and free mining; (2) absence of binders of appreciable strength or hardness; (3) firm roof needing only moderate support adjacent to the faces; (4) coal parts freely from the roof; (5) coal characteristics and/or roof pressure favorable to peeling or shearing from the face; and (6) bottom fairly firm.

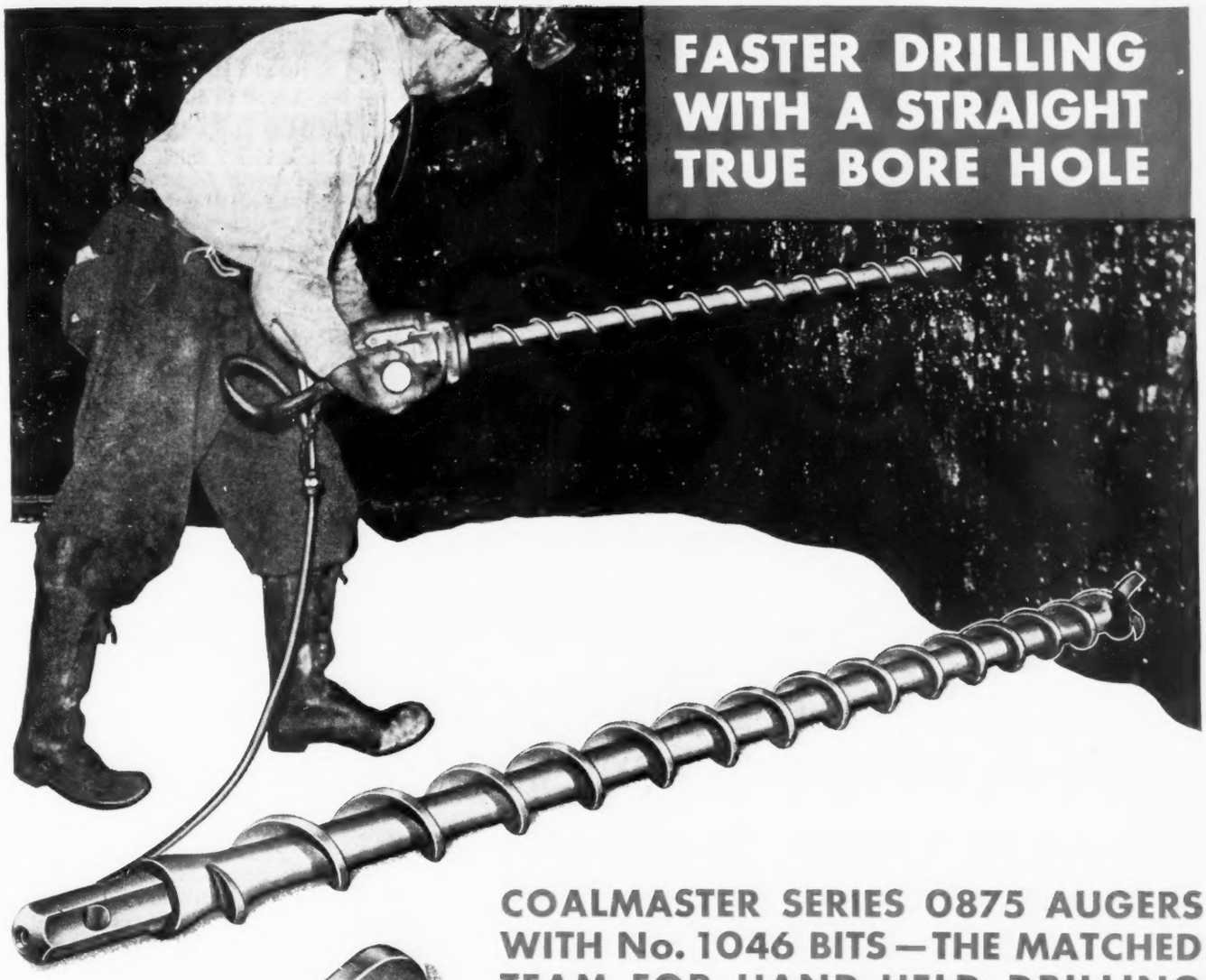
Completely new estimates of United States coal reserves will be available in ten years at the present rate of progress, said Paul Averitt, U. S. Geological Survey, Washington, D. C., in his paper, "Work of the Geological Survey on Coal and Coal Reserves." Reserves are being classified as "measured coal," "indicated coal" and "inferred coal," he pointed out.

To simplify comparison with former estimates, the limits of coal 14 in. thick and located within 3,000 ft. of the surface are being followed, with several intermediate divisions. Bituminous thicknesses are classified as: (a) more than 36 in.; (b) 24 to 36 in.; and (c) 14 to 24 in. It has been suggested that those classifications be changed to: (a) more than 42 in.; (b) 28 to 42 in.; and (c) 14 to 28 in.

Commenting on the paper, B. R. McKay, Geological Survey, Canada, said that recently completed estimates for Canada show the minable coal to be less than 10 percent of the total reserves as established in 1913. Coal now is being mined 5,000 ft. below the surface at one Canadian operation.

Organizing a cooperative research program, said Elmer R. Kaiser, assistant director of research, Bituminous Coal Research, Inc., progresses through four phases: (1) concept of a project or program; (2) preliminary discussions; (3) organizational meetings and committees; and (4) financing the program. His paper, "Organizing and Financing Cooperative Research," includes case histories illustrating each phase for four research programs now under way. Patience, diligence, optimism and confidence are essential for accumulating the initial funds with which to start a cooperative project, it was pointed out.

During the discussion, Howard N.



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Eavenson said that research is needed on prevention of gob fires, acid mine water, mine lighting and better and safer haulage. Mr. Kaiser reported that the organization of a cooperative research program on gob fires is now in the second phase, that is, preliminary discussions. Ralph A. Sherman, Battelle Memorial Institute, said that 28 cooperating sponsorship research programs are now under way at Battelle and that $1,000,000 a year is being spent on them, with the oldest established in 1934.

"Correlation of the Performance Characteristics of Domestic Stoker Coals With Their Chemical and Petrographic Composition" was the title of a paper presented by R. J. Helfinstine, mechanical engineer, and G. H. Cady, senior geologist and head, Coal Division, Illinois Geological Survey. Of the measured combustion characteristics, heat obtained was the only one that exhibited good correlation with several factors secured by chemical analysis, and its most useful correlation was with B.t.u.'s on an as-fired basis, it was reported.

No other combustion characteristics provided good correlation with data or combination of data from the chemical or petrographic analyses. Uniformity of combustion showed a fair correlation with percentage of ash, Giesler test of fluidity of ash and percentage of vitrain. Shatter tests on clinker correlated fairly well with clinker-ash ratio.

"A Study of Coal Classification and Its Application to the Coking Properties of Coal" was presented by Michael Perch and C. C. Russell, Research Department, Koppers Co., Inc. Three-dimensional graphs of transparent and tinted plastic sheets used to investigate complex relationships leading to discovering possible correlations were exhibited.

Coal dock construction, equipment and operations of the North-Western-Hanna Fuel Co. at the port of Duluth-Superior were described in considerable detail by J. T. Crawford, general superintendent of docks. Of the 16 coal docks operated by 10 companies, five are owned by North Western-Hanna, which handles approximately 30 percent of the 10,000,000 tons yearly distributed from the Duluth-Superior port.

•

New Developments

•The Pittsburgh Plate Glass Co., Pittsburgh, Pa., has acquired the controlling stock interest in the Midvale Coal Co., Midvale, Ohio. The coal company is to be liquidated and the mine, which is a deep operation producing about 2,800 tons daily, will be operated as the Columbia Coal Division, Pittsburgh Plate Glass Co., with Paul C. Beutel, associated with its Columbia Chemical Division since 1936, as manager of the coal division.

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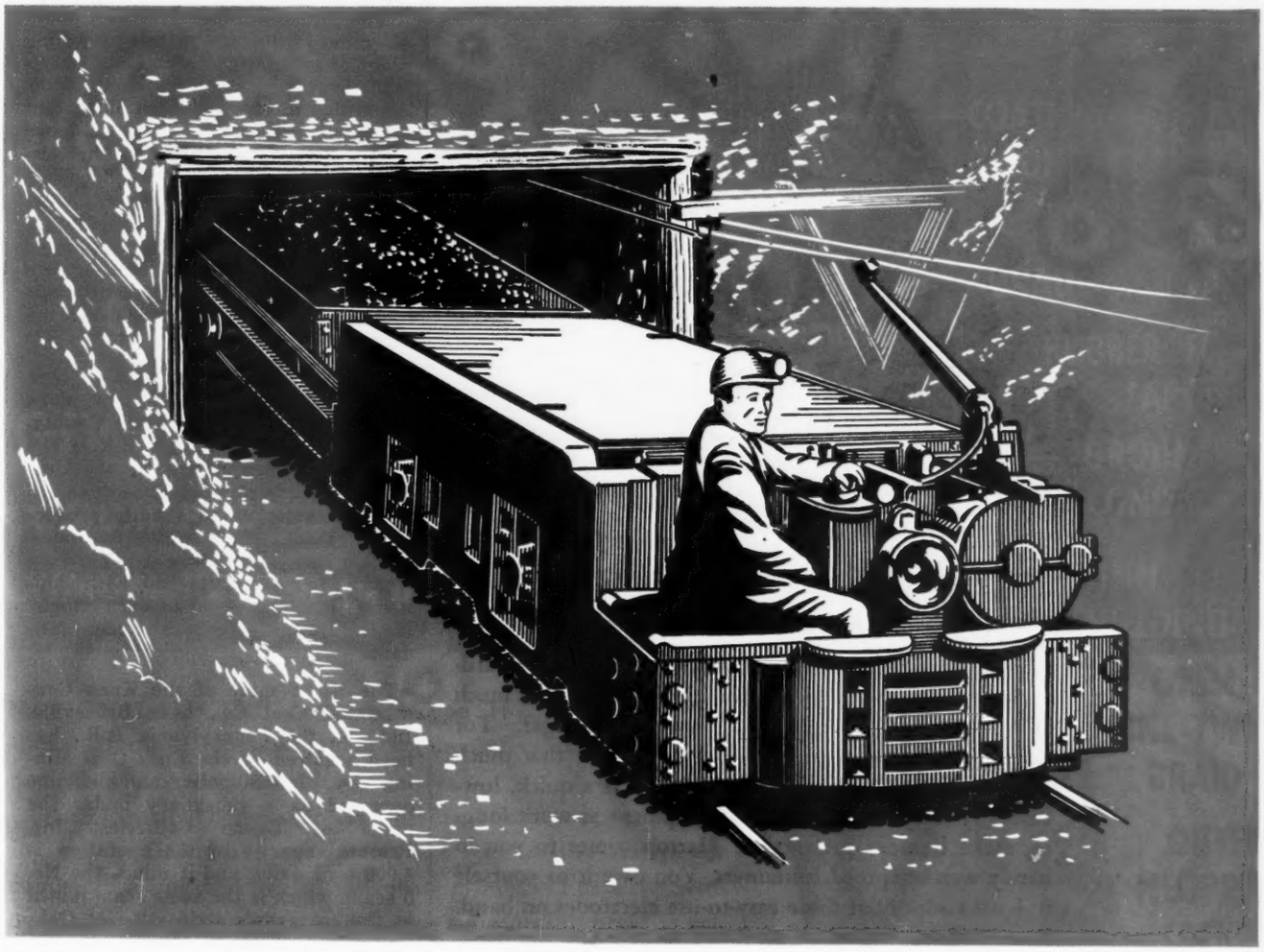

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LUBRICATION — "ENGINEERED TO FIT THE JOB"

V. L. Henry, president, Creighton (Pa.) Fuel Co., who acted as a consultant for Pittsburgh Glass during purchase negotiations, will continue to serve as a consultant for the coal operation. Robert W. Rutlidge, Midvale president, is retiring to manage personal affairs.

The Midvale mine is located about 45 miles from the alkali-producing plant of Pittsburgh's Columbia Chemical Division at Barberton, Ohio. According to reports, about 60 percent of the mine's output will be shipped by truck to the plant for use in power generation, with the remainder sold to the regular commercial customers of the coal company. The mine is highly mechanized and has estimated coal reserves sufficient for 30 years operation. A new tipple recently was completed to replace the one destroyed by fire late in 1947.

•Simpson Creek Collieries Co., New York, recently opened a new slope mine at Vasper, Campbell County, Tenn., on the Southern R.R. The operation, which is mining the Coal Creek seam, is completely mechanized and is developing to a daily production of 2,000 tons. Loading machines, shuttle cars and belt and chain conveyors are being employed, with shipments made over a modern tipple. H. G. Turner is general superintendent.

•The No. 5 mine of the Knox Consolidated Coal Co., near Bruceville, Ind., on the Pennsylvania R.R., has been acquired by the Enos Coal Mining Co., Indianapolis, and will be operated as a subsidiary under the name of Enoco Collieries, Inc. Present capacity of the operation is 4,000 tons daily, and it mines the No. 5 seam, which is the same seam mined at the company's strip mine at Oakland City. Work to expand capacity to 6,000 tons daily was expected to get under way immediately.

The purchase is reported to have included 4,000 acres of coal land, a new Link Belt tipple recently completed and other assets. George E. Enos, executive vice president of the parent firm, will serve as president of the new subsidiary.

•Construction has been started on a new completely automatic coal-cleaning plant expected to cost over $825,000, according to R. T. West, vice president and general manager, West Virginia Coal & Transportation Co., West Columbia, W. Va. The company is expected to begin development very soon of a new mine at West Columbia. Fully mechanized, the new mine is planned for a capacity of 4,000 tons daily, with the output to be used for power generation under contract with the American Gas & Electric Co.

•Alicia No. 3 mine of the Hillman Coal & Coke Co., Greensboro, Pa., has reportedly been leased by the Duquesne Light Co., Pittsburgh. The

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Alicia operation adjoins Duquesne Light's Warwick mine and it is understood that Warwick entries will be extended into the Alicia property.

•The Union Carbide & Carbon Co., New York, is reported to be negotiating for the purchase of mining equipment and leases in Noble County, Ohio, owned by Testa Bros., Inc., Dexter City. It is understood that the coal would be used in a power plant to be built by Union Carbide near Marietta, Ohio. The proposed sale would not affect other Testa Bros. properties in Ohio and West Virginia, it is said.

•Stripping of the Buffalo No. 10, seam, under lease from the Boone County Coal Corp., recently was begun by Blythe Bros. Construction Co., Charlotte, N. C. Coal from the property, which is located near Boone County's No. 2 mine at Monclo, W. Va., is being cleaned and loaded at Boone County's plant there. Coal is hauled from the Blythe Bros. stripping by truck and dumped into a 300-ton bin from which it is lowered to the tipple and cleaning plant by a 1,000-ft.-long 16-deg.-declined belt conveyor at a rate of 350 t.p.h. Merle Wagers is general superintendent of the Blythe Bros. operation.

•Dalton Mines, Inc., Pikeville, Ky., has changed its name and will be known as the Mountain State Coal Corp.

•A new mine, reported to be the first completely mechanized operation in the eastern Oklahoma-western Arkansas field, was opened Nov. 12 by the Quality Excelsior Mining Co., Hackett, Ark., at formal ceremonies attended by more than 400 guests, including industry and union leaders in the section. According to reports, the new mine, which is a trackless operation, is expected to reach full production of 1,500 tons daily by next summer. Output is to be shipped via a 2½-mile spur recently completed by the St. Louis-San Francisco Ry.

•A new strip mine expected to produce 500 to 600 tons daily reportedly has been opened by the Millwood Coal Corp., Millwood, Ky. The company is said to have 2,500 acres available for development and shipments will be made by the Illinois Central R.R. A. H. Robertson, formerly superintendent, Vogue Coal Co., Madisonville, is president of the firm and is in charge of operations.

•Extensive explanatory drilling, in preparation for a new mine that is expected to get under way by late 1949, has been reported on property leased by Kaiser Co., Inc., Sunnyside, Utah. The lease, which comprises 2,510 acres of coal lands near the company's present operations, will be opened up by construction of a new road in the near future, it is said.

•Stripping operations recently start-

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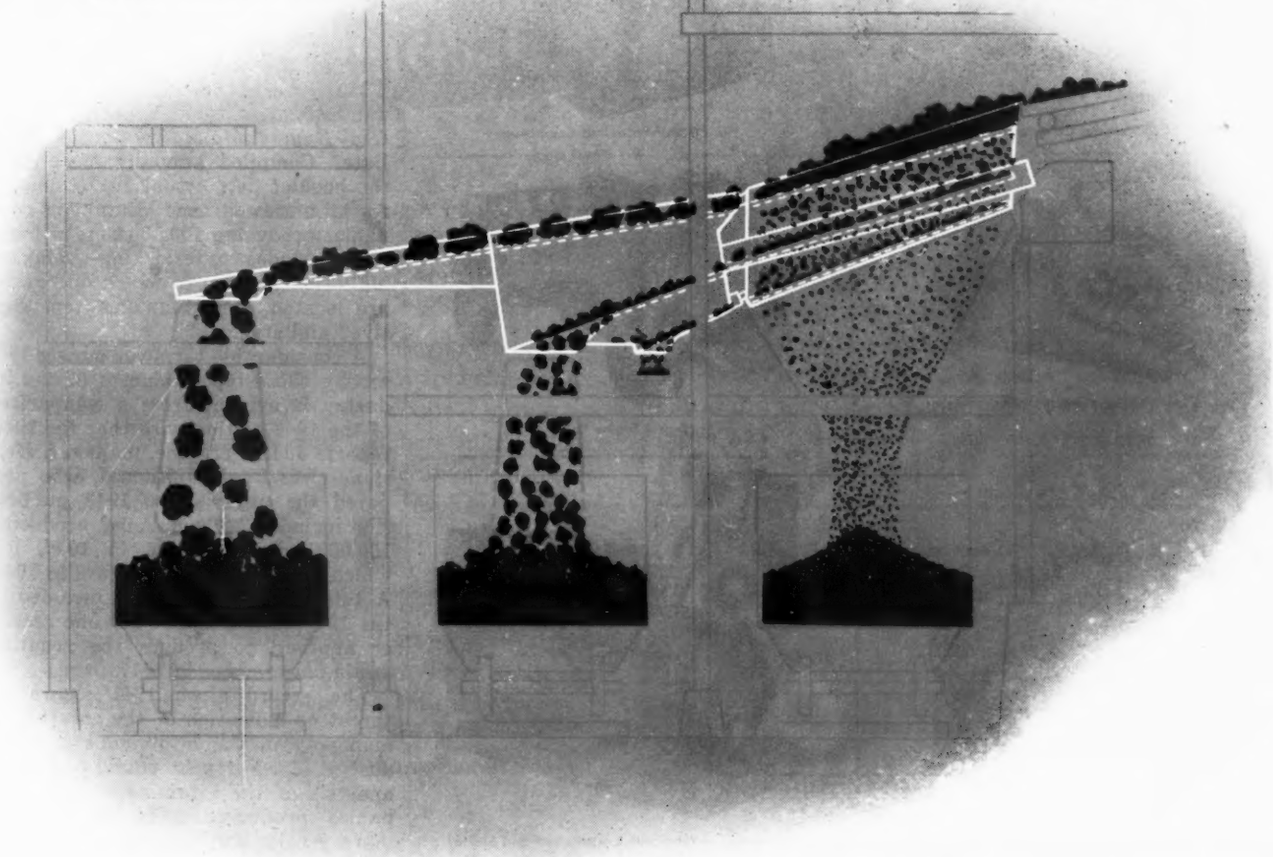

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ed by J. H. Cox, Denver, and V. B. Smith, Worland, Wyo., near Scofield, Carbon County, Utah, are reported to be the first strippings of any size in Utah. The area contains three seams of coal. The new operation is to mine the top seam, 10 ft. thick and lying under 45 ft. of overburden, and the second, 6 ft. thick and separated from the first by 5 ft. of material. The bottom seam was mined by the Union Central Coal Co. until a fire forced closing of the operation in 1875. The fire may still be burning, as far as known. Coal produced by the Cox and Smith operation will be marketed by the Utah Fuel Co. and will be prepared at that company's Castle Gate plant.

•Sullivan Trails Coal Co., West Pittston, Pa., has opened its new Mary Ann strip mine at Buckhannon, W. Va., mining the Redstone and Pittsburgh seams. Capacity is 600 tons daily and coal is loaded over a tipple on the B. & O. R.R.

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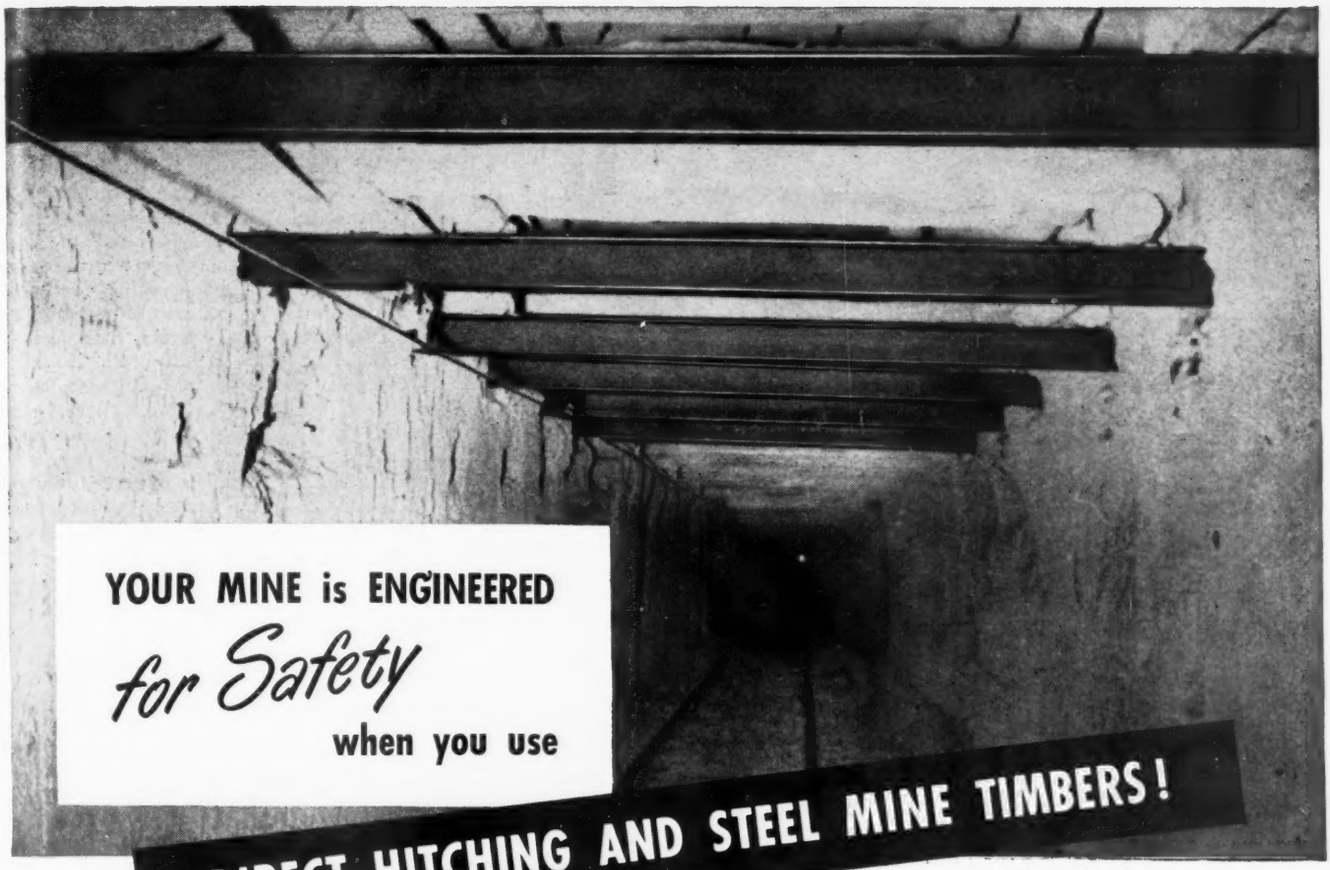
Keystone Booklet Lists 1947 Company Tonnages

Coal operating companies producing 100,000 tons or more in 1947 totaled 1,073, a net gain of 88 over 1946, according to a booklet, "Coal Production in the United States, 1947, by Companies," just issued by the *Keystone Coal Buyers' Manual*, a *Coal Age* affiliate. Compiled annually since 1941, the booklet lists actual 1947 tonnages for all anthracite and bituminous companies producing 100,000 tons or more, and includes interlocking company affiliations, states in which operations are located, strip tonnages and "captive" affiliations.

A considerable turnover during 1947 among these top producers of the industry is evident from a comparison of the 1947 edition with that for 1946, reports J. R. Forsythe, manager, *Keystone Coal Buyers' Manual*, who prepared the study. The 1947 publication includes 220 companies producing 100,000 tons or more in 1947, but which fell short of that figure in 1946. A total of 132 companies included in the 1946 edition failed, for one reason or another, to produce the required minimum tonnage in 1947.

The record since 1941 shows no threat or indication of the creation of monopoly in the bituminous coal industry, Mr. Forsythe points out in an analysis of the bituminous coal companies producing 1,000,000 tons or more yearly. In 1947, there were 107 affiliated groups comprising 270 companies producing that tonnage and their combined output was 353,000,000 tons, or 57 percent of the total bituminous output. In 1941, the 248 companies producing 1,000,000 tons or more, also comprising 107 affiliated groups, produced 284,000,000 tons, or 56 percent of the total for the industry. While the number of companies



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in this category varied from a low of 244 to a high of 273 in the years from 1941 to 1947, the greatest portion of total bituminous output produced by them was 62 percent, recorded for 1942 and 1943.

While increasing strip tonnage has been an important factor in the expansion of the bituminous industry since 1941, the development of new deep mines and the mechanization and expansion of existing mine facilities have been even more important, it was pointed out. During this period, some 209 deep mines with a daily capacity of 500 tons or more have been developed. Total capacity of these 209 new deep mines is reported at 125,000,000 tons yearly.

Copies of the company-tonnage booklet may be secured from *Keystone Coal Buyers' Manual*, 330 West 42 St., New York 18, N. Y., at $5 per copy.

•

Missouri Students Tour Area Mines

The senior class of the Missouri School of Mines held its annual field inspection trip from Oct. 17-28, with the 45 seniors in mining engineering spending 10 days on a 1,700-mile tour of mining operations in Missouri, Oklahoma, Arkansas and Illinois, and the 23 seniors in petroleum engineering inspecting oil field operations in and about Houston, Tex.

The mining group, under the direction of Prof. D. R. Schooler and R. F. Bruzewski, saw a good representation of all the possible types of mining installations, including the most up-to-date machinery and methods of operation. In addition, the students were invited to parties, banquets, and picnics that were sponsored by mine operators and school alumni.

•

Engineer's Day Set for Colorado Mines School

The 15th annual Engineer's Day of the Colorado School of Mines, to be held in Golden, Colo., Friday, April 22, 1949, will feature speakers on many phases of the mineral industries, as well as exhibits and scholarship examinations, according to a preliminary announcement recently released.

Exhibition space, both indoors and out, is available free of charge to all industries engaged in or related to the discovery, extraction, and refining of minerals and petroleum. Exhibitors must, however, assemble and take down their displays. The event affords exhibitors an excellent opportunity to acquaint future mineral engineers, as well as many alumni and visitors, with their products and organizations, it was pointed out.

J. Robert Medaris, Golden, Colo., is chairman of the Engineering Day Committee.

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Foreign Developments

McGRAW-HILL *World News*

GREAT BRITAIN—The part of the program calling for fines of British miners for habitual absenteeism, as recommended late in October by the Joint Committee on Production composed of government and union representatives, ran into heavy sledding last month as union locals in at least five mining districts rejected the proposal. The plan had provided for the setting-up of a joint union-management attendance committee at each mine, which would regularly interview men who had missed shifts without a satisfactory explanation and impose fines, and even dismissal, on men whose attendance did not improve. The locals objected on the basis that such harsh discipline was not generally necessary, and that where it was, it was a matter for management.

FRANCE—By mid-November the six-weeks-old Communist-dominated miners' strike appeared to be definitely on the wane, with the government reporting that mines in some sections were producing up to 86 percent of normal. Rioting and violence between government troops and miners, with killings on both sides, characterized the strike, which successfully crippled French coal production for many weeks. Production during October reported at 580,000 tons, about one-eighth of 1947 average monthly output.

GERMANY — Temporary limited control of the Ruhr coal, iron and steel industries was turned over to German trustees Nov. 10 by a joint order of the United States and British military governments. The action, which left the question of ownership of the properties to a future German legislative body, was expected to result in greater operating efficiency and faster repair and replacement of machinery and equipment by decentralizing operating control of the huge unwieldy enterprises. Increased incentive for German workers and management also was thought to be a factor.

Among other things, the order called for the liquidation of some 25 large cartels and their reorganization into an undetermined number of operating companies, with former owners being barred from participation. Division of the companies, final authority over them and selection of the German trustees will be functions of the military government. Bitter opposition to the plan was immediately voiced by French government leaders who felt that the Ruhr should continue under international control.

Coal Firm Sets Pensions For Non-Union Workers

A pension plan for all employees not covered by the U.M.W.A. Welfare Fund has been announced by the Reitz Coal Co., Windber, Pa.

The plan follows recommendations recently adopted by the Central Pennsylvania Coal Producers' Association. The company will pay two-thirds of the cost, and the employees the other third. Under the program, employees who wish to participate will pay 2½ percent of their earnings into the fund, if they earn up to $3,000 a year. Those making above that will pay 4½ percent.

•

Union-Bargaining Order Dissolved by Court

The court order requiring the U.M.W.A. to bargain with the Southern Coal Producers' Association, in effect since last summer, was dissolved Nov. 10 by Federal Judge T. Alan Goldsborough, who remarked, "This is the kind of order I like to sign."

Dismissal of the injunction was requested by Winthrop A. Johns, assistant general counsel, N.L.R.B., who reported to the court that the union had complied with the order and that a contract had been negotiated.

Meanwhile, the N.L.R.B. last month ruled that a union shop contract signed without an election by employees is a violation of the Taft-Hartley Act. A case covering the contract between the steel companies and the U.M.W.A. is still pending.

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Indiana Coal Producers Grant Purdue Fellowship

The establishment by the Indiana Coal Producers' Association of a five-year $12,000 fellowship in the department of forestry at Purdue University, payable at the rate of $2,400 a year to a graduate student, was announced Nov. 8 by E. R. Martell, head of the department. Research under the grant will be specifically directed toward problems of establishing native hardwoods on stripped-over land in the state.

Recipient of the fellowship for the first year will be Donald Arnot, Jr., Nappanee, Ind. Mr. Arnot, who received a bachelor's degree from Purdue last spring, will work for an advanced degree.

In October, Mr. Arnot accompanied L. E. Sawyer, director of forestry and reclamation for the Indiana association, on a tour of the stripped land in the state. Twelve sites were selected as sample plots to be planted next spring. In the meantime, Mr. Arnot will lay out the plots and make soil analysis.

The new grant succeeds a three-

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year fellowship at the department of agronomy at Purdue for the study of problems of establishing grasses and legumes on spoilbanks. A final report on this research is expected to be released early in 1949.

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Hudson Coal Resumes Student Mine Corps

After a lapse of 20 years, the Hudson Coal Co., Scranton, Pa., has engaged three 1948 graduate mining engineers to comprise a corps of students to learn practical methods of coal production. Purpose of the program is to provide the company with trained mine officials in the future.

The three new men, all of whom were members of the armed forces during the war, are: Donald Mitchell, Tyler Hill, Pa., a graduate of Penn State; Edward J. Lee, Scranton, also from Penn State; and William B. Roth, Allentown, a graduate of Lehigh.

•

Construction Begun on Anthracite Laboratory

Work on the new anthracite research laboratory being built with federal funds at Schuylkill Haven, Pa., was started Nov. 4 with groundbreaking ceremonies attended by Bureau of Mines and coal company officials. Construction of the building has been contracted for at a cost of $379,000.

Among those present at the ceremonies was Ralph E. Taggart, president, Philadelphia & Reading Coal & Iron Co., which donated most of the land on which the new laboratory is to be located.

•

Report Issued on Derailment Accident

Excessive speed caused the derailment of a string of mine cars in the Olga No. 1 mine, Olga Coal Mining Co., Coalwood, W. Va., Oct. 4, resulting in the death of three miners and injuring 12 others, according to an investigation report made public last month by the U. S. Bureau of Mines. The derailed cars knocked out upright timber supports, causing rock and timbers to fall on the 28 men in the four cars, the report stated.

To guard against similar accidents, besides recommending that man-trips be operated at safe speeds, the inspectors proposed using slides, skids, or other means to control man-trips descending grades where the locomotive is unable to do so; seeing that man-trip cars are not overloaded; and providing sufficient cars in good condition for man-trip use.

For still greater safety, the inspec-

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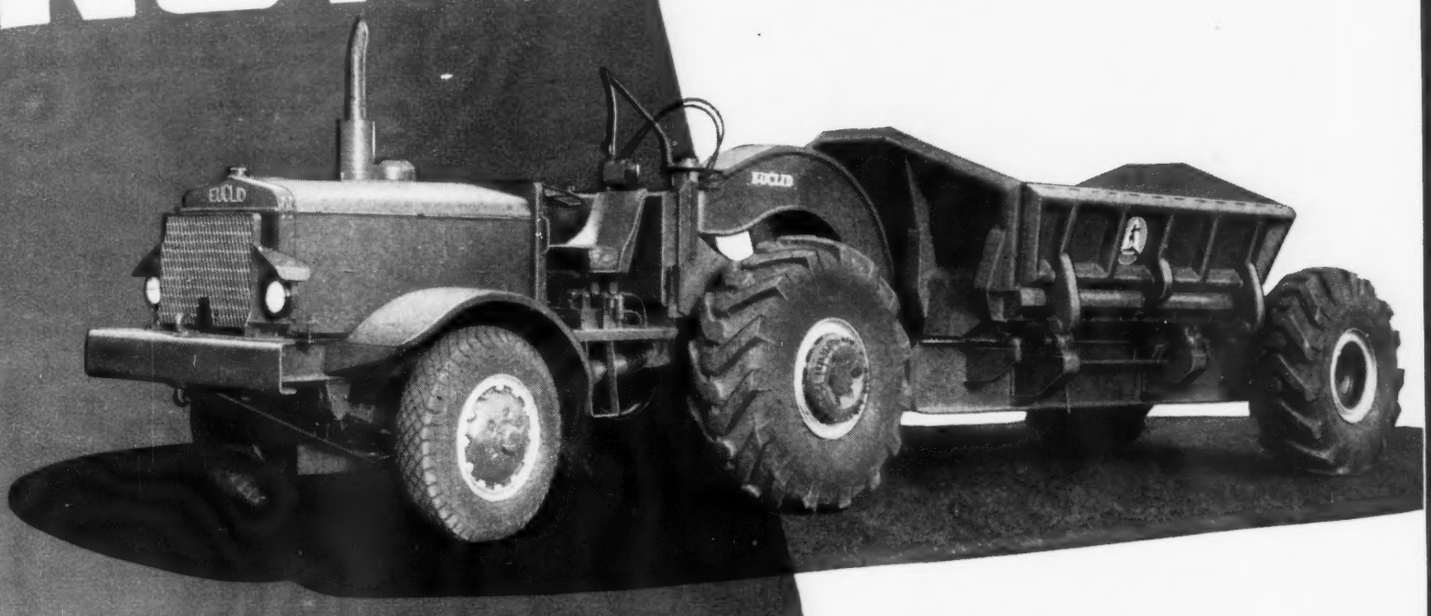

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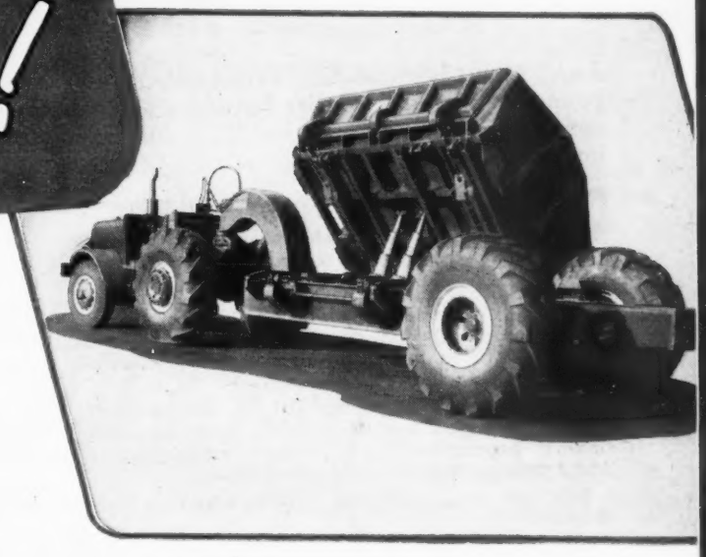
The Side-Dump Euclid Model FDT-98W is powered by a 200 h.p. diesel engine... drive and trailer tires are 24.00 x 25... top speed with 20-ton payload is 32.8 m.p.h.



This new Euclid provides fast non-stop dumping over the edge of fills and waste banks. It meets the demand for a Side-Dump semi-trailer built as a *complete* unit. Engineered for efficient and dependable performance, its wide trailer body is ruggedly constructed for hauling rock, ore and other heavy excavation.

For mine, quarry and industrial off-the-road hauling, this Side-Dump Euclid has the speed and capacity to move more yards at less cost.

Euclid twin hydraulic hoists raise the body and its 40,000 lb. payload quickly . . . down-folding gates open automatically when the body is raised to right or left dumping position . . . high dumping angle and smooth interior assure fast shedding of load.

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EUCLIDS

Move the Earth

tors suggested providing small-capacity, steel-covered man-cars, and hitching uprights along main haulageways into the rib or wall or, if this is impracticable, protecting them from derailed cars by substantial guard rails or spacers. The inspectors pointed out that if men had been required to ride on only one side of the cars, five or six men instead of 28 would have been endangered by this accident, and they would have had more chance to avoid falling rock.

•

Coal Heating Booklet Reviews Accomplishments

Some of the many accomplishments and activities of the Coal Heating Service groups operating throughout the country are summarized in a new booket, "The Coal Heating Service Market," recently published by the Coal Heating Service Division of the National Coal Association. The booklet includes typical examples of the work the local groups are carrying out and outlines, particularly, the results secured to date in the fields of advertising and public relations.

In releasing the publication, the national division points out that already the Coal Heating Service market has become an important market for coal and coal-heating equipment, with more than 14,500,000 people living in the 49 market areas in the 21 states where local groups are operating. These C.H.S. groups are serving approximately 21.5 percent of the total population of these 21 states.

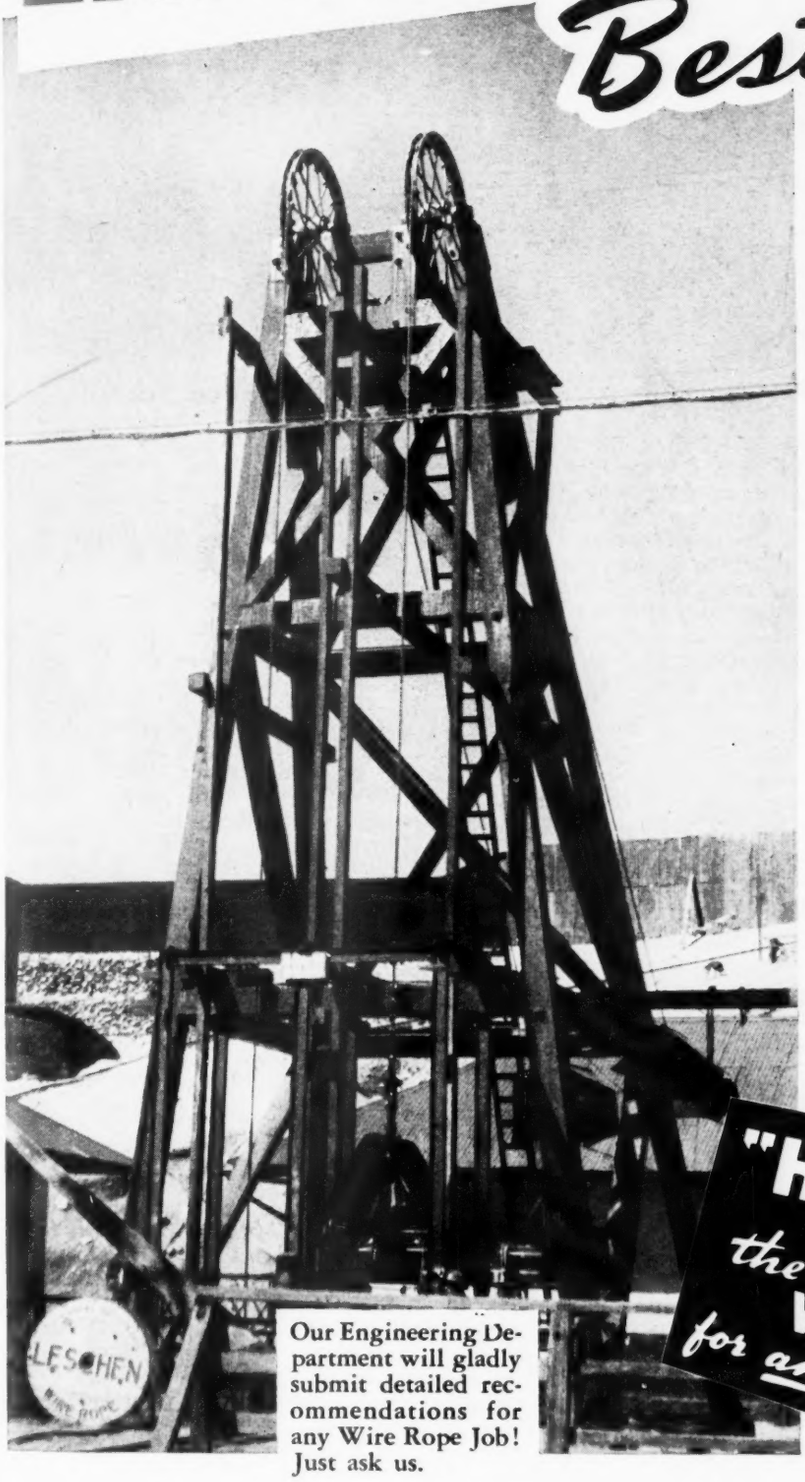
•

Third M.E.G. Exhibit Staged in Illinois

About 200 representatives of manufacturers and suppliers participated in the third annual mine equipment and supply exhibit held by the Mining Electrical Group at the Franklin County Country Club, West Frankfort, Ill., Oct. 5-7. Although the three-day event was primarily staged as an opportunity for the several hundred coal mine officials attending to study the equipment and supplies on display, it also attracted large numbers of the public, students and others interested in the industry.

While the exhibits generally featured supply items and replacement and maintenance parts, a number of companies displayed heavier equipment units. Among these were: American Mine Door Co., portable rock-duster for mounting on a rail car or on a drill or supply truck for use in trackless areas; I-T-E Circuit Breaker Co., mine sectionalizing equipment; Joy Mfg. Co., two portable rubber-tired air compressors; National Cylinder Gas Co., gas cutting and welding machines; P. G. Sharp Co., lightweight

EXPERIENCE *is The Best* GUIDE!



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Men who operate mining equipment, need not be reminded of the important part that wire rope plays in determining their final production costs.

Experience has proved that the longer a rope lasts, the lower is its cost per unit of work done. Less time, too, is wasted in making replacements.

It is *also the experience* of a large number of Wire Rope users that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for top-flight performance. Its toughness . . . its easy spooling . . . its unusual endurance—make for longer life, faster work, and lower operating cost.

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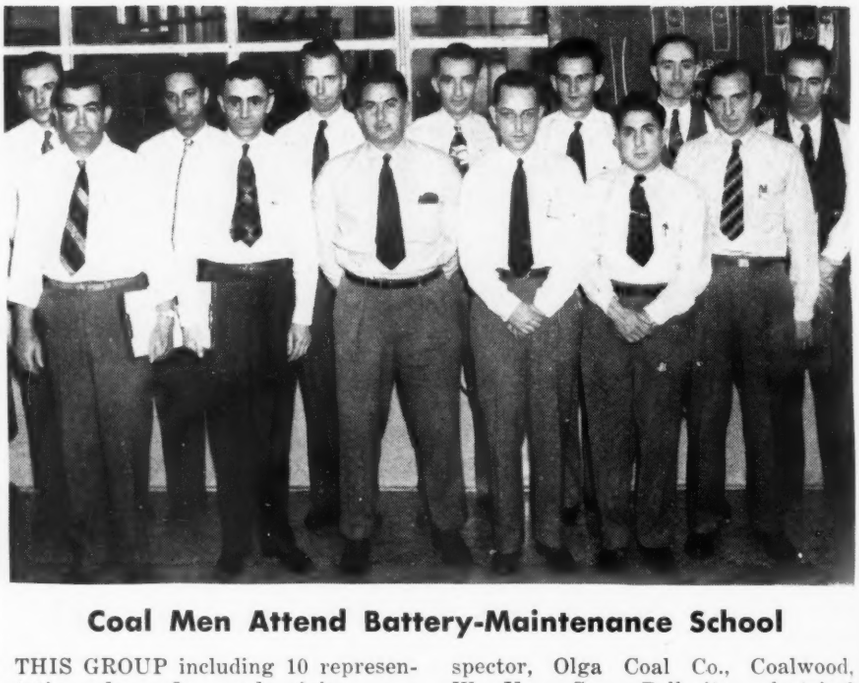

Coal Men Attend Battery-Maintenance School

THIS GROUP including 10 representatives from five coal mining companies, was the first class to attend a series of one-week "schools" in storage-battery maintenance and repair planned by the Gould Storage Battery Corp., Trenton, N. J. The first course, held Nov. 8-12, included lectures by Gould engineers and outside authorities, laboratory projects and demonstrations at a laboratory specially fitted for the purpose at the Gould plant in Trenton. The program was particularly designed to enable those receiving the instruction to pass their training along to their co-workers on their return. Following examinations, class members were presented diplomas at a luncheon on Friday.

Members of the first class (above) included: front row—T. B. Wolfe (left), equipment inspector, Olga Coal Co., Coalwood, W. Va.; John A. Kalasky, shop foreman, Coal Division, Eastern Gas & Fuel Associates, Kimball, W. Va.; A. Wayne Bitner, research assistant, Pennsylvania State College; J. Fred Norris, battery inspector, Olga Coal Co., Coalwood, W. Va.; Sam Pellerite, electrical engineer, maintenance department, Consolidation Coal Co. (W. Va.), Fairmont, W. Va.; and Victor Mullins, maintenance foreman, Mine No. 204, Consolidation Coal Co. (Ky.), Jenkins, Ky. Back row—Stan V. Malin (left) and Ken Marsh, Gould engineer trainees; Allen Obenshain, mechanic, Republic mine, Republic Steel Corp., Praise, Ky.; Al M. McAfee, Gould sales trainee; Joseph Varson, maintenance foreman, Mine No. 214, Consolidation Coal Co. (Ky.), Jenkins, Ky.; Mike Sidick, master mechanic, Castle Shannon Coal Co., Coverdale, Pa.; and Paul L. Jones, maintenance foreman, Coal Division, E.G.&F.A., Grant Town, W. Va.

According to M. W. Heinritz, Gould vice president, so successful was this course for coal men that future five-day schools will be conducted for other coal and metal mining groups, as well as for groups composed of men from other industries concerned with lead-acid battery operation.

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portable arc welder; Western Machinery & Engine Co., diamond core drill, with bits and reamers.

Among those exhibitors featuring items that were new or recently developed or improved were: Bearings Service Co., ball bushings for carrying round shafts in linear travel; Cardox Corp., high-pressure compressor, high-pressure valves and air discharge tube, "Airdox" system; Farmers Engineering & Mfg. Co., "Femco Trolleyphone"; Mine Safety Appliances Co., Model B stud driver for driving steel studs in steel or concrete, small portable rock duster; M-R-C Bearings Service Co., steel-reinforced synthetic rubber sealed bearings; Oberjuerge Rubber Distribution Co., Goodyear cross-rifled conveyor belt; B. E. Schonthal & Co., Victaulic flexible pipe couplings; Jack Van Horn Mine Supplies, Clarkson drop-forged uni-flight conveyor replacements, Clarkson self-closing mine-door hinge, Wonway free-wheeling oil-sealed automatic backstop clutch for inclined conveyor; Star Jack Co., lightweight aluminum post jack. An outside exhibit by the John Fabic Tractor Co., local representative of the Caterpillar Tractor Co., featured a tractor, bulldozer, earth-mover, crane and a portable diesel-driven a.c. power plant that provided electricity for the show.

Arrangements for the show and its operation were handled by a committee from the manufacturers' division of the M.E.G., consisting of Frank E. Rhine, Sterling Steel Castings Co., chairman; William Lindsay, Socony-Vacuum Oil Co.; Harry Sutherland, Central Mine Supply Co.; and E. O. Wiederanders, Jeffrey Mfg. Co.

Hudson Coal Miners Receive Safety Training

Broadening of the current program to provide anthracite miners with safety training (*Coal Age*, November, p. 130) was reported last month, with two separate schools scheduled to get under way Nov. 5 and 16 at the Baltimore colliery of The Hudson Coal Co.

The "Safety Course for Miners" is sponsored by the U. S. Bureau of Mines, with the cooperation of the U.M.W.A. and coal companies, and is expected to be extended to many other operations in the region. The courses being given at The Hudson Coal Co. total 16 hours of instruction and miners completing the study will receive an engraved certificate and a Bureau of Mines pocket card signifying their accomplishment.

•

Anthracite Map Project Subject at A.I.M.E. Meet

"The U. S. Geological Survey's Pennsylvania Anthracite Project" was the subject of a talk by Howard E. Rothrock featured at the fall meeting of the A.I.M.E., at the Hotel Redington, Wilkes-Barre, Pa., Oct. 15. Mr. Rothrock is chief of the party of the U. S. Geological Survey that is carrying out the project. H. A. Dierks presided as meeting chairman. W. Geise is section chairman.

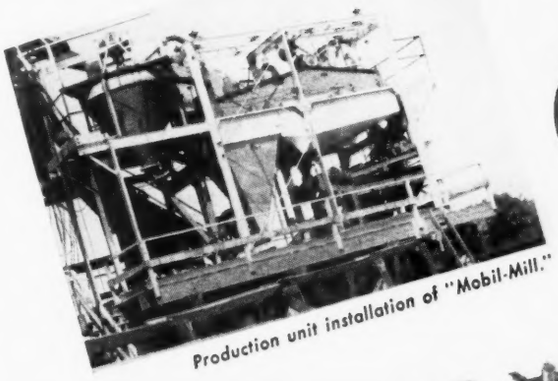
The purpose of this study of the Pennsylvania anthracite fields, undertaken with the approval of the Bureau of Topographic and Geologic Surveys and with the help of the Pennsylvania Department of Mines, is to assist in extending the life of mining operations in the anthracite region, Mr. Rothrock said. Ultimately, there will be published a series of maps with supplemental text describing unit areas of the fields. This study will not only bring to date the Grand Atlas published by the Pennsylvania Geological Survey in the 1890's but it will also be extended in scope to take advantage of types of information not available to the authors of the older publication.

Maps for the current project will be issued to a scale of 1 in. equals 500 ft. and, prepared by modern photogrammetric methods, will show topographic features with far greater accuracy than has been practicable before. Each map will cover about 8½ square miles, and will constitute one-sixth of the standard topographic quadrangle. Such a unit area will be represented by four sheets: one will show culture, topography, warranty ownerships and strippings; the second, the location of all known coal outcrops; the third, the subsurface structure of one or more of the principal coal beds in the area; and the fourth, cross-sections and text.

The Geological Survey believes that these maps will be useful in long-

WKE (HMS) "MOBIL-MILL"

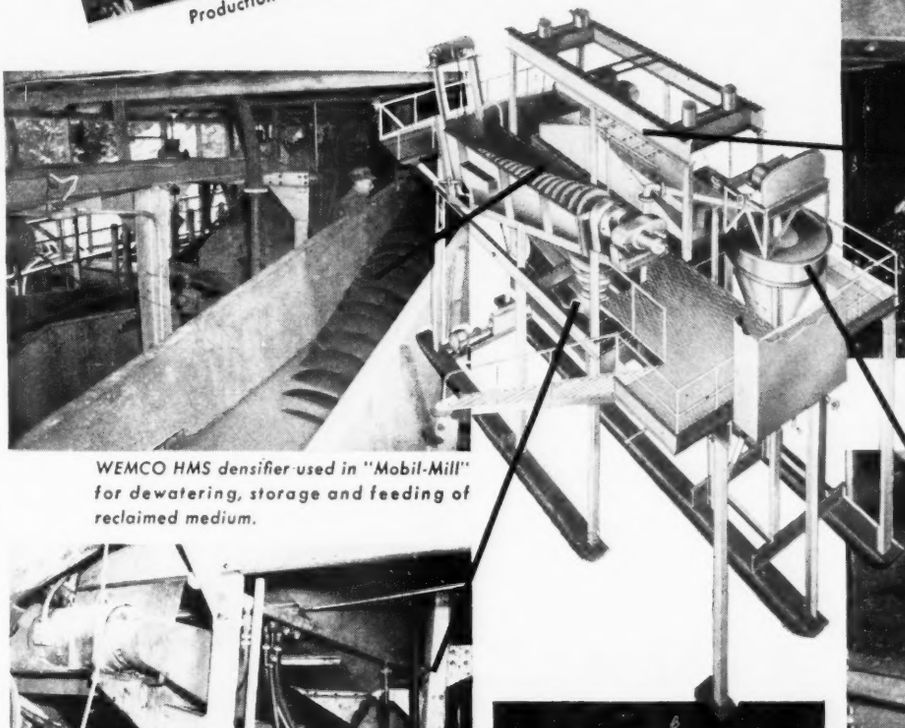
Gets Results!



Production unit installation of "Mobil-Mill."

"Mobil-Mill" production units are getting results—profitable results . . . in coal and mineral processing fields. "Mobil-Mills" are showing operators a new way to get production at greatly reduced costs.

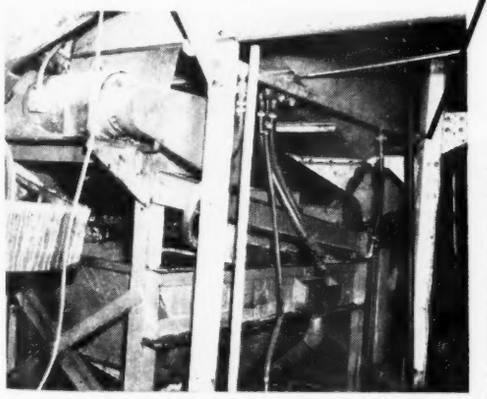
Write WEMCO for complete details on "Mobil-Mill"



WEMCO HMS densifier used in "Mobil-Mill" for dewatering, storage and feeding of reclaimed medium.

Product—medium washing screen showing refuse (left) and valuable mineral (right).

WEMCO HMS separation vessel in "Mobil-Mill" for separation of sink and float products.



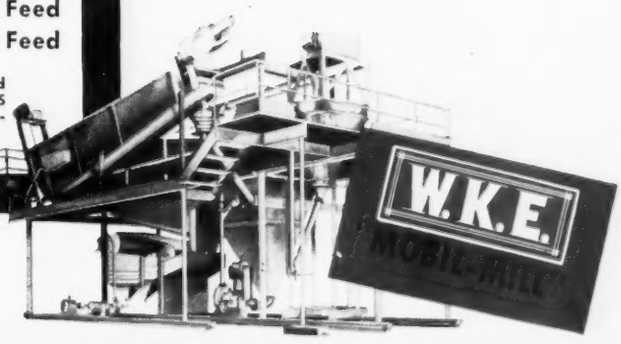
Magnetic separator section of "Mobil-Mill" for reclamation of magnetic medium.

Rent or Buy

4 SIZES

15-25	TPH Feed
25-35	TPH Feed
50-60	TPH Feed
90-125	TPH Feed

Also design and construction of HMS plants for any tonnage requirements.



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"S-H" Classifiers • Thickeners • Conditioners • Agitators • H M S Separatory Vessels • Sand Pumps • H M S Thickeners • H M S Densifiers • WKE (HMS) "Mobil-Mill" • H M S Medium Pumps

range planning for further development of the fields and for utilization of the coal. The maps will also be helpful in solving local developmental problems that involve such geological factors as faulting, folding, continuity of structure, and identification and correlation of the coal beds.

The success of the project depends only in part on the work of the Geological Survey, said Mr. Rothrock. The chief contributors are the coal mining companies, without whose aid the usefulness of the study would be immeasurably impaired. The Geological Survey's part in the project is to abstract and correlate the information furnished by the companies and to fill in the gaps which they cannot supply. Generous cooperation has been given by the coal companies operating in the Mount Carmel area, where the study was begun. If similar help is received in other areas, the survey will be successful in contributing to the general effort to extend the life of mining in the anthracite fields, he emphasized.

Following Mr. Rothrock's talk, a three-dimensional motion picture in color illustrating the preparation of topographic maps by photogrammetric methods was shown, along with exhibits of color separation of completed maps and aerial photographs of mapped areas.

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Illinois Mining Institute

(Continued from page 124)

with this type of dryer. A better solution to the problem of abrasive fines is to condition the feed by pre-screening and rinsing on a vibrating screen having ½-mm. openings. The ash in the dryer feed can be reduced four or five percent by moderately good screening and rinsing to remove part of the fireclay and abrasive fines. This tends to increase screen life since it leaves the dryers with very little abrasive material to handle.

The key to the successful operation of the McNally-Carpenter dryer, continued Mr. Wilson, seems to be constant and careful inspection and maintenance, together with regular sampling of the feed and dried product. The mechanism is virtually trouble-free as long as abrasive wear is caught and remedied before the machine is damaged. The screens can be checked for holes during operation by observing the effluent for oversize particles. This should be done several times each shift to avoid any excessive loss of salable coal. Sampling for product moisture and ash will show evidence of flush ring overflow, usually as a result of excessive coal loss or plugged drainout.

Idle-shift maintenance, declared Mr. Wilson, determines, almost entirely, the results obtained from the dryer. He stressed the importance of careful and periodic inspections, and he indicated that if a plant could not afford

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CINCINNATI DUPLEX CHAIN

Hardened Eccentric Pin puts joint wear between pin and insert . . . doesn't turn in block. With replacement of pin and insert the joint is like new.

Alloy steel, heat treated Rivet holds bearing pin against longitudinal displacement. Easily removed.

Easily replaced, hardened alloy steel Connector Insert gives fresh from the factory joint accuracy to worn connector.

- The Cincinnati Duplex Chain as well as the Cincinnati Standard Chain is engineered for a minimum of power consumption and a maximum life.
- Cincinnati Chains, made of the finest alloy steel, are engineered to place wear and tear on inexpensive easily replaceable parts.
- Cincinnati Chains because of superior design, engineering and metallurgical perfection require a minimum of servicing
- The Cincinnati double-ended reversible Duplex Bit greatly reduces bit setting time. Duplex Bits are firmly locked into chain avoiding loss of bits and loss of time.
- Cincinnati Duplex Bit eliminates sharpening operations and out-cuts ordinary Mine Sharpened Bits from 2 to 6 times per point.

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a spare unit it should have a spare rotor assembly.

The moisture in the 10-mesh feed is reduced about 50 percent by presizing over ½-mm. screen cloth, he reported. That is, a wet feed having 33 percent moisture will be reduced to about 16½ percent in the centrifuge. If either the top or bottom size of the feed were increased, we would probably make a greater moisture reduction, said Mr. Wilson.

Wedgewire and Bixby-Zimmer screens are being tried in this type dryer in an attempt to increase the efficiency in both operation and maintenance. The current production models of the McNally-Carpenter dryer with the new rib structure and screen assembly may cut replacement labor costs as much as 50 percent. The new design also does away with the old framed screens. Rubber may be used in place of steel for some of the wearing parts. The useful life of the rubber parts is less than that expected from steel, but lower initial cost and more expedient replacement will probably make the rubber parts more desirable.

While the purpose of his paper was to outline the problems of dryer maintenance, Mr. Wilson concluded by stressing that the units were reliable, efficient and economical.

"We have come to the conclusion that it is economical to use a centrifugal dryer as a reclaiming machine in connection with preparation-plant slurries, providing the oversize material in the sludge has satisfactory quality," said Laning Dress, Binkley Coal Co., Pinckneyville, Ill., in his paper on the "C.M.I. Centrifugal Dryer." The paper contained much operating data on this type of dryer (the latest model with two discharge openings), despite the fact that the installation was only five months old.

The feed to the dryer is piped from the bottom of the washery settling cone. The quantity of solids in the feed varies from 15 to 50 percent, fresh water being added when the sludge becomes too thick. The fresh water thins out the feed and permits a certain amount of the fine solids to be extracted along with the liquids. At present, the dryer is handling about 50 t.p.h. of feed. Of that, 15 t.p.h. is reclaimed fine coal and 35 t.p.h. of feed. Of that, 15 t.p.h. is reclaimed fine coal and 35 t.p.h. is effluent that is pumped to waste. These rates are based on dry-coal weights.

The following operating costs (in cents per ton of dryer product) were listed by Mr. Dress: (1) screens, 2.47; (2) spiral flights, 2.86; (3) power for 65-hp. connected load, 4.33; and (4) maintenance labor, 0.86. The total operating cost is 10.52c. per ton of dryer product.

The average life of the screens is 62 hours and they cost $23 per set. The spiral cone flights last about 275 hours and cost $118 per set. Flights and screens are the only items that have been replaced since the installa-

The New ATHEY PD-10Q QUARRY TRAILER
. . . High-Speed, Rubber-Tired Hauling Unit

● Setting new records in rock and quarry hauling, the Athey PD-10Q rubber-tired Trailer is a new production star in the hauling field. Speed and capacity, with agile dumping ability to either side, make this new teammate for the "Caterpillar" Diesel DW10 Tractor a profit winner for contractors and pit operators.

Sturdy, welded construction of new high-tensile strength steels withstands the impact and abrasion of rock loading. Heavy hexagonal shaped crossmembers absorb the torque or twist in the frame when dumping. Low pressure tires — interchangeable with the DW10 driving tires — reduce rolling resistance, permit faster hauling of heavier loads. See your nearest Athey-"Caterpillar" Dealer about the PD-10Q today, or write . . .

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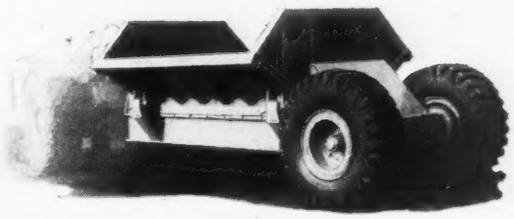


BRIEF PD-10Q SPECIFICATIONS

Capacity, Struck, Cubic Yards	5½
Capacity, Heaped, Cubic Yards (approximate, based on 2:1 slope)	10
Dimensions:	
Overall Length, Trailer Only	23' 9½"
Overall Length, with Tractor	35' 8"
Overall Width	10' 10"
Overall Height	7' 7"
Body Length, Inside	9' 8"
Body Height, Inside (Top of Side Plate)	2' 1"
Body Width, Inside	10' 2"
Loading Height, Across Side	5' 9¾"
Loading Height, Across End	7' 5"
Tread	84"
Tire Size (Standard) Rock Grip	18.00 x 25 — 20 Ply
Brakes	Air-Operated from Tractor Brake Controls
Wheelbase	20' 5½"
Weight, Shipping, Trailer and Hydraulic Control System (Approx.) Pounds	15,000

Athey

Rubber-Tired Trailers


FORCE-FEED LOADERS


MOBILOADERS


FORGED-TRAK TRAILERS


RUBBER-TIRED TRAILERS

tion of the unit on May 15. The dryer operates one shift, five or six days a week. Two men can change a set of screens in two hours.

In a talk entitled "Cleaning Plants I Have Known," William C. McCulloch, Roberts & Schaefer Co., Chicago, recalled many of the historical developments in the field of coal preparation that have occurred over the last 25 years. During the second half of his talk he conducted the audience on a guided tour, via slides, of the new Freeburn mine "all-stoker coal" preparation plant, located near Herrin, Ill.

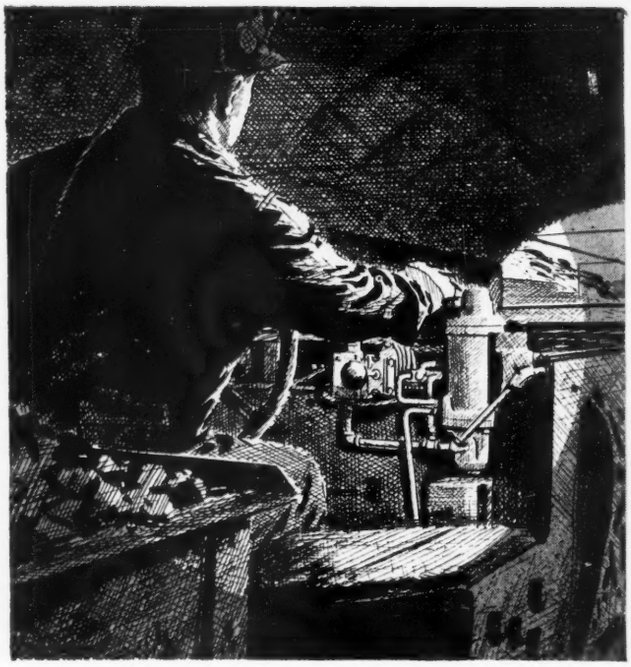
The 400-t.p.h. plant was designed and constructed by the Roberts & Schaefer Co. "The design combines wet and dry methods—water washing for coarse coal and pneumatic separation for the smaller sizes, both with special arrangements to insure sizing and quality standards and to eliminate waste in rejects. It has been called an all-stoker plant because the crushing and screening facilities can convert the entire product into stoker coal if desired; this, however, does not prevent the preparation and loading of any other size or combination of sizes within the entire range from lump to slack."

The raw-coal feed is, of course, presized before cleaning. The crushed lump added in with the 6x1½-in. coal is washed in a single tandem Hydroseparator. The 1½x0-in. raw dry coal from the primary shaker screen is separated by vibrating screens into 1½x¾-in., ¾x5/16-in., 5/16-in.x10-mesh, and 10-meshx0 for convenience and efficiency in pneumatic cleaning. The 1½x¾-in. coal is prepared in a standard single-pack Stump Airflow, the ¾x5/16-in. in a standard two-pack Stump Airflow, and the 5/16-in.x10-mesh in a standard three-pack Stump Airflow. The 10-meshx0 undersize is delivered to a bin for loading in combination with the sludge product from the Hydroseparator circuit, and the cyclone dust recovered from the dust-recovery units associated with the Stump Airflow units. Several bypass and mixing arrangements permit the loading into railroad cars of combinations of any or all of the various sizes prepared.

Prof. H. L. Walker reported to the Institute that student enrollment in mining engineering and scholarship holders is up 350 percent. Most of the 47 students are freshmen and sophomores. Other students on the campus have expressed a desire to transfer to mining the second semester of this year, he said. The mining department feels that at least 50 to 60 mining engineers should be graduated each year to meet the requirements of the industry. The increase in mining enrollment is attributed to the excellent opportunities for employment upon graduation and employment at a very satisfactory salary. A brochure entitled "Careers in Mining Engineering" distributed to graduating high school students, high school principals and high school vocational advisors

Putting WESTINGHOUSE BRAKES on your locomotives

Puts the brakes on maintenance too



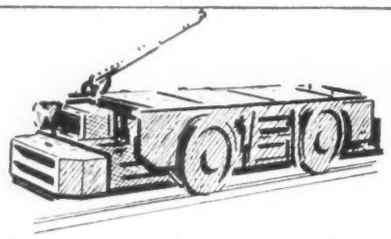
One of the most important steps in any high-speed haulage program is the installation of *dependable power brakes* . . . and it's an important step in maintenance-control programs, too.

Westinghouse brakes mean greater safety in controlling trips, higher allowable speeds, and quicker, more-accurate stops. And in addition, they bring substantial savings in locomotive maintenance that soon pay for the brake investment.

One user reported that the use of power brakes had increased brake shoe life from one week to three months and decreased wheel turning 50%. Less sand was required, and better rail contact cut power loss and overheating.

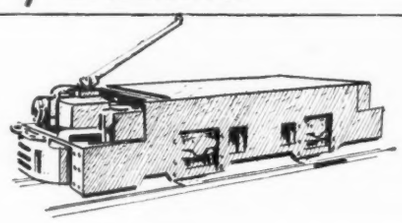
Motor bucking to check speed or stop was entirely eliminated, with a consequent saving in repairs and replacements of split motor pinions, broken axles and armature shafts, and loosened coils.

For *Light* Locomotives



For smaller locomotives where space is limited, Westinghouse Hydraulic Brake Equipment provides a complete, practical answer to power brake needs. Rugged, husky parts are small and compact, can be easily fitted into available space. Installation can be handled when unit is in shop for overhaul.

For *Heavy* Locomotives



On larger, heavier locomotives used for long hauls with heavy trips, where space is available for compressor and tank, Westinghouse Air Brake Equipment is recommended. It reflects the engineering and workmanship that has safeguarded railroad travel for over three-quarters of a century.

Ask for information on power brakes—air or hydraulic—for your locomotives.

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INDUSTRIAL DIVISION WILMERDING, PENNSYLVANIA

"Give us the tools . . ."

For High Wages, Full Employment . . . Business Must Have Better Tools *and More Money to Pay for Them*

So far we have escaped the post-war depression predicted by leading government economists. How can we continue to frustrate gloomy prophets who see only depression ahead?

At the end of World War II the federal Director of Reconversion saw depression immediately ahead. He said we would have 6,000,000 unemployed four months after VJ-Day and 8,000,000 a few months later.

But we did not have depression. We did not because:

First, the American business man, sensing the obligations of a vastly more important post-war America, went ahead to build his plant and equipment to meet expanding domestic and world markets—markets bigger actually and potentially, in terms of world-wide trade and profits than any previously envisaged.

Second, the American businessman was able to get the money to go ahead. Since 1945 he has spent $50 billion building new plants and buying new equipment.

There may be other reasons why we missed a depression in 1946. But—make no mistake about it—what has powered our present prosperity is the $50 billion spent by businessmen since VJ-Day to improve their plants.

It provided jobs directly for 5 million people. It paid for more than half of our record-breaking steel output. It put in place the foundations of great new industries such as television. It strengthened the foundations of the chemical, machinery, plastics, steel and oil industries. It has expanded and improved our power systems throughout the country.

This spending has made the difference between prosperity and slump, between industrial strength and serious deterioration.

In fact, we know now that what business spends for new plants and new tools always makes the difference between prosperity and slump, the difference between national strength and weakness.

The accompanying chart tells the story. When we have spent heavily for new plants and equipment, we have had prosperity and strength. When we have not, we have been in trouble.

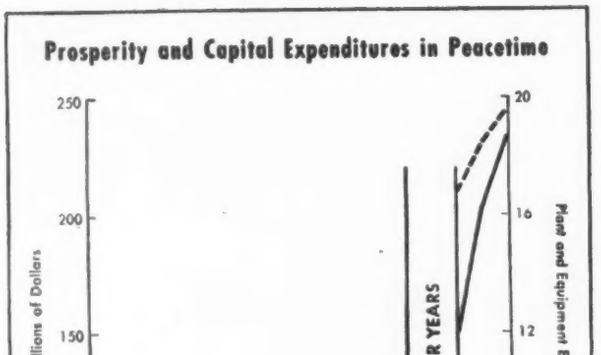
We would have been in trouble since VJ-Day except that business used its war reserves, plus two-thirds of its profits, plus borrowed money to improve and expand its facilities. This year industry is spending $19 billion this way.

Has this great post-war expansion actually made our economy a "mature economy"? Have we come now to the saturation point the New Dealers mistakenly said we had reached in the '30's?

The answer is no!

Proof of that answer is being developed through a McGraw-Hill national survey of "Business' Needs for New Plants and Equip-

continued on next page



ment" details of which will be given in this editorial series in coming months.

We have a bigger nation, more people, to serve right here at home. Further we must meet human needs which the war created around the world. Also, we must sustain a world position such as this country never assumed before.

Here are immediate things crying to be done.

1. Business still needs billions to expand production because our country and our needs are growing rapidly. Example: To meet the demand for power, electric utility companies must nearly double their present generating capacity in 10 years. That will cost more than $7.5 billion. To fill increasing needs for oil and gasoline, oil companies must spend at least as much.

2. Business still needs billions to get its plants up to date and overcome wear and tear. Examples: Over half a million of our freight cars, a third of the total, are more than a quarter of a century old. About two-thirds of the looms in the textile industry are more than 20 years old. Half of our coke ovens, basic equipment for iron and steel production, are more than 20 years old, and only half as efficient as modern ovens.

3. Business still needs many billions to do new things in dramatic new ways. Example: Machinery that will cut out 80% of the dirty, dangerous work of mining soft coal has been perfected. A new automobile engine plant will reduce the work that goes into engine-building by three-quarters.

Hundreds of similar things that our scientists and engineers have developed could be cited. They can be found in every industry. They hold immeasurable promise of adding to the abundance of American living. In fact, there is hardly a step along the whole route of industry—from roughing out raw materials to delivering finished goods—where there are not new and better ways of doing things standing ready for general use.

But the crucial question now is: Where is the money coming from to put to work these new and better ways of doing things?

Business has used its own resources so far... profits and reserves. The stock market, where industry traditionally has raised money from people willing to risk their savings, has been limping along, giving business no chance to get enough money on satisfactory terms. *Business now must look primarily to its own earnings for the money to carry out the improvements which are necessary if America is to keep itself strong and efficient.* The next editorial in this series will deal with this new and crucially-important role of profits.

But business can not count on profits alone to do the job. Profits are too uncertain.

From now on finding the money... to put new ideas and new equipment to work... to go ahead with the expansion and improvement that will thwart depression and build industrial strength *. . . calls for the support of all Americans everywhere.*

This comes right down to *you... for at stake is your chance for steady work, for better pay, for new things like television, and for more of the every-day things, like coal and clothing, of better quality and at less cost.*

By helping business get new and better tools, you will help yourself—and you will help build a more sound, more prosperous, better America.

James H. McGraw, Jr.

President, McGraw-Hill Publishing Company, Inc.

has created more interest in mining courses at Illinois.

Last month a Mining Advisory Committee, composed of representatives of the mining industry of the state, was established to assist the mining faculty at the University of Illinois in problems of the industry affecting the educational program. The committee consists of Henry C. Woods, Sahara Coal Co., chairman; George F. Campbell, Old Ben Coal Corp.; D. H. Devonald, Peabody Coal Co.; Miles Haman, Crystal Fluorspar Co.; B. E. Schonthal, Illinois Mining Institute; H. H. Taylor, Franklin County Coal Co.; H. A. Treadwell, Chicago, Wilmington & Franklin Coal Co., and Paul Weir, Paul Weir Co.

Prof. Walker brought 20 mining students to the Institute meeting. Of the group, 15 were holders of scholarships sponsored by the following: Illinois Mining Institute (2); Old Ben Coal Corp. (2); Peabody Coal Co. (4); Alfred E. Pickard (1); and Sahara Coal Co. (6).

The future progress of the coal industry in Illinois—the state's second largest industry—could well rest in the hands of the 60 young mining engineers that we hope to graduate each year from the University of Illinois, said Henry C. Woods, chairman of the newly-created Coal Mining Advisory Committee. In reviewing the state of the industry, he said, "Yes, we have made great progress in the mechanization of the mines—in the development of machines and methods to increase the output of every miner. But in the development of coal mining engineers to direct the operation of these giant projects and to conduct intelligent and intensive research we have been woefully inadequate."

There are two tasks ahead, said Mr. Woods: (1) we must provide proper facilities for training young men; and (2) we must show them the special advantages of such a career. One phase of the program—the work of reviewing the curriculum in mining engineering—is already underway. The advisory committee also will advise in the research program at the University, on the new mechanical devices being built for the industry, and on matters of safety and accidents in the mines. It also plans to stimulate increased interest in mining courses by organizing a week-long trip to the campus each summer for high school principals and vocational advisors, with all expenses paid.

A special resolution read by George F. Campbell, Old Ben Coal Corp., keynoted the start of a drive to obtain a new mining engineering building to accommodate adequate instructional and research facilities at the University of Illinois.

The technical papers presented at the afternoon session were prepared and sponsored by the eleven-year-old Mining Electrical Group of Southern Illinois, West Frankfort, Ill. W. J. Jenkins II was session chairman.

Greater stability of the power sup-

ply, through an increase of generating and transmission-line facilities, makes it imperative that the user give more thought to the protection of equipment and distribution lines, warned E. T. Groat, Kelso-Burnett Electric Co., Chicago, Ill., in a paper on "A.C. Power and Its Use for Strip Mining." Electrical manufacturers' representatives, said Mr. Groat, have been preaching interrupting capacity for the past several years. In the beginning, much of the pleading fell upon deaf ears, because it was hard to see why a circuit breaker, if properly applied from the thermal or current-carrying standpoint, would not carry all of the current that might flow through it under some abnormal condition such as a short circuit on the load side.

"With our ever increasing capacity of generating equipment, transmission and tie lines, the required interrupting capacity of all protective devices is steadily increasing. I recommend that you start a survey of your own power system and its protective devices, by determining from your power company what the interrupting capacity is at your service location, and also what it will be in the foreseeable future. And do not stop there; go on to be sure that you have coordinated protection throughout your system. So that some inadequate device, even down the line, will not disrupt service in a part of your plant by destroying itself and perhaps stopping the entire plant by tripping the main service breaker," Mr. Groat said.

"We have noted the trend toward the purchase of power at 33 kv. with primary metering, involving the ownership of stepdown transformer stations—many of them portable—by the operating companies. The advantages of this trend are obvious: one metering point, lower I^2R losses, less voltage drop, and, above all, reduced power costs. These savings will pay for the cost of ownership of the substations in a relatively short time and, thereafter, you have the advantage of continuing lower power costs, and control over the location and use of your substation."

Low power factor results in higher system losses, excessive voltage drop, and in some instances decreased productivity, Mr. Groat continued. Many transformers, lines and circuit breakers are overloaded because of uncompensated wattless current flowing in those circuits. This is particularly true around washers. It was suggested that the power factor of the circuit be improved through the installation of capacitors at the terminals of the induction motors. Mr. Groat also warned that synchronous motors on large electric shovels and draglines should not be considered as a power-factor corrective device for the entire mine load.

It was suggested that stripping operators consider the purchase of standardized electrical devices, such as switchhouses, so they will be able to pool their stocks of electrical parts,

Here's a new, ideal HARD-FACING COMBINATION

for better low-cost wear protection on ALL heavy equipment

STOODY SELF-HARDENING 21
FOR EXTREME ABRASION RESISTANCE
RECOMMENDED FOR: Bulldozer Blades, Dippers, Elevator Bucket Lips, Crushers, Impellers, Muller Tires, Grizzlies, Etc.

STOODY 1027
FOR WITHSTANDING SEVERE IMPACT
RECOMMENDED FOR: Tractor Track Rollers, Idlers, Crawler Pads, Mechanical Loader Lips, Tie Tamping Bars, Picks, Etc.

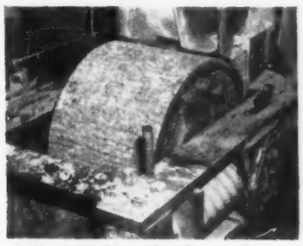
IDEAL QUALITIES in hard-facing rods are relative . . . ask yourself, IDEAL FOR WHAT? The rod that's highest in wear resistance won't have ultimate impact strength, or vice versa. A down-hand rod might not position weld. Type of equipment, wear factors encountered, application problems, as well as economy determine the "best" hard-facing rod for specific uses.

That's why Stoody has introduced two new hard-facing alloys for the heavy equipment field, Stoody Self-Hardening 21 and Stoody 1027. We've split their personalities and their jobs to give you a choice between the utmost abrasion resistance or maximum impact strength with good wear resistance . . . both types are low-cost hard-facing electrodes! Both have been completely field tested for over a year and passed with flying colors. Results on recommended applications are positive!

TYPICAL STOODY HARD-FACING APPLICATIONS

MULLER TIRES—*Unprotected Muller tires normally lasted 2 years. After applying 75 lbs. of Stoody Self-Hardening 21 this tire shows practically no wear in 5 month's operation, will probably last 3 years or more with greatly increased efficiency.*

DREDGE PUMP CASING—*a typical application of Stoody Self-Hardening 21. A ¼" single pass layer is applied manually to the new casing. May be reapplied as needed.*



ROLL CRUSHER—*High speed operation in quartzite, etc., chewed off former alloy in 24 hours. Stoody Self-Hardening 21 lasted a full week and does not spall even after repeated applications. Outperforms $2.00 per pound rods.*

Here's what enthusiastic users say about the new Stoody Self-Hardening 21

"We have been using Stoody Self-Hardening 21 for the past year on the top hammers of our Disintegrator on heavy industrial grinding operations. Our experience has been very satisfactory and we have found the rod easy to apply."
Signed: S. P. Wilson
Plant Engineer
Joseph Wagner Mfg. Co.
San Francisco, Calif.

"After two months test on pressure rolls crushing "Haydite" Stoody Self-Hardening 21 shows 50% better wearing qualities than competitive rod."
Signed: Adolph Schaad
Plant Sup't.
McNear Brick Co.
San Rafael, Calif.

"Stoody Self-Hardening 21 used on cement mixer paddles and tamper heads is lasting twice as long as regular Self-Hardening. Very pleased with cost of application and way rod is going on."
Signed: M. H. Forbush
Foreman
Pollard Bros.
Fresno, Calif.

"We are now using Stoody Self-Hardening 21 as our standard crusher maintenance hard-facing alloy after comparing performance with alloys costing as much as $5.00 per pound. It not only performs better but provides a sounder weld when repeatedly applied. Stoody Self-Hardening 21 is the finest hard-facing rod yet developed for this type of work."
Signed: Harry Gravos,
Welding & Crusher
Maintenance Specialist
Spokane, Washington

"We ran careful tests on a number of hard-facing rods and found Stoody Self-Hardening 21 to have exceptional wear resistance, high rate of deposition and we have eliminated our former trouble with spalling after repeated applications. We always have more demand for roads than money to build them and the low cost of our hard-facing is a help to our budget."
Signed: D. E. Kirchner
King County Road District #2
Seattle, Washington

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just as they have been doing with mechanical items. Standardization would enhance the resale value of those items, said Mr. Groat.

The second paper of the afternoon session, "Service Units for Trackless Mining," was presented by E. M. Arentzen, Lee-Norse Co., Charleroi, Pa. Quoting from the Bureau of Mines Circular No. 7244, which describes some of the better greasing systems now in use and outlines recommended practices for storing, transporting and handling of lubricants in and about coal mines, Mr. Arentzen said: "The use of portable-type lubrication cars is the safest and most efficient method of transporting, distributing and using grease and oil inside of coal mines. These cars are either of the special pressure-pump-lubricating type or are special cars used to transport containers of lubricant from place to place.

"The special pressure-pump type serves the dual purpose of transporting the lubricants and providing the medium and equipment for lubricating the machinery with a minimum of handling, and eliminates inside storage and exposure of the lubricant to possible contamination. This method also provides a preferred lubrication job which can be done during the idle shift and may be included with the routine inspection of the equipment."

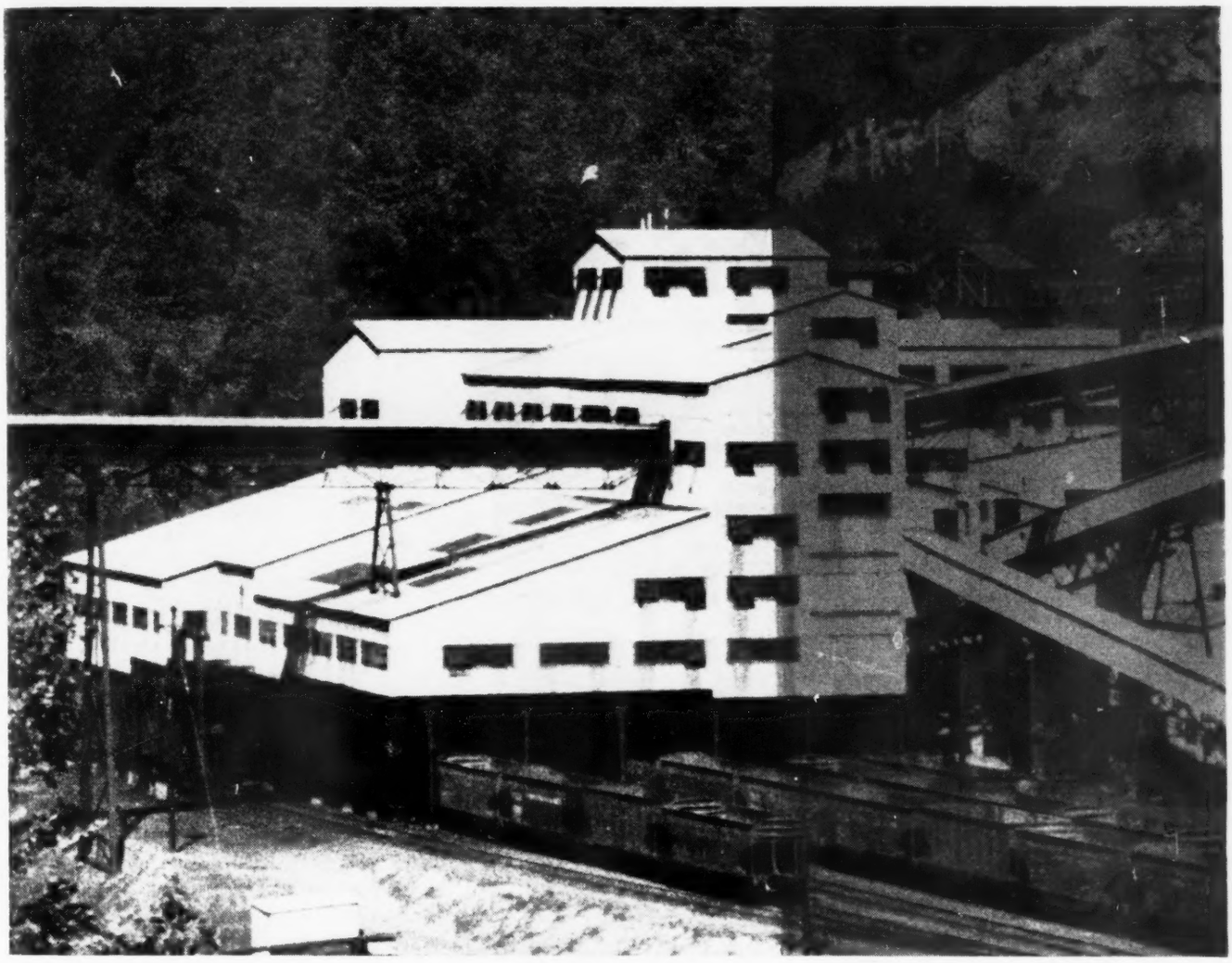
The Lee-Norse Type MT6 permissible greasing truck, sometimes referred to as the mine service station on wheels, has an air compressor driven by a separate motor which provides air to operate the lubricant pumps, air brakes and the air sanders, Mr. Arentzen said. It has three compartments for grease and oil: (1) a round tank in the center for hydraulic and machine oils, capacity 3 bbl.; (2) one side tank for transmission lubricants, capacity 2 bbl.; and (3) a side tank for chassis lubricants (pressure-gun grease), capacity 1 bbl. The grease car weighs 6½ tons fully loaded and can travel 8 to 10 m.p.h.

Where it is not feasible to have a greasing unit leave the section, a combination greasing-, timbering- and post-puller unit is available. This 4½ ton unit has a four-speed transmission unit.

Mr. Arentzen also mentioned the part that the Baker units (tractor, timbering machine and "The Trike") are playing in the role of service units.

The illustrated talk entitled "Roof Support With Suspension Rods," by C. C. Conway, chief engineer, Consolidated Coal Co., St. Louis, Mo., continues to hold the attention of mining audiences. Mr. Conway has presented this topic at two national meetings this year: The American Mining Congress at Cincinnati, Ohio (*Coal Age*, May, p. 139); and the Mine Inspectors' Institute of America at Columbus, Ohio.

The topic is a popular one because of the fact that falls of coal and roof are the major cause of mine accidents and are contributing causes to 50 per-



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AS NIGHT FROM DAY . . . *your coal and its market potentialities when prepared the* FAIRMONT *way - wet or dry!*

Coal isn't just coal anymore—a specification fuel is the goal and a definite requirement! Meet those requirements with improved preparation techniques . . . methods adapted to *your* coal. FAIRMONT, located in the heart of the "coal country" and living with coal for over forty years, offers an accumulation of knowledge of your special problems that you can put to profitable use. Write, whether you are considering a complete new preparation system or improvements on your present equipment. FAIRMONT can tailor the design and construction of complete or partial installations to produce a better product and greater profits for you.

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Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning

cent of mine fatalities. Mr. Conway's talk describes one solution to this menacing problem.

Briefly, the method consists of reinforcing the roof by adding suspension rods before the roof has a chance to take a permanent set. Where limestone is not available for anchoring the suspension rods, a thick roof of shale may be held if the rods reach beyond the natural arching zone, Mr. Conway points out.

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National Safety Council

(*Continued from Page* 126)

for carelessness, indifference and chance-taking, Mr. Northover stated, and he reminded his listeners that it is easier to apply a penalty than to tell a miner's wife that her husband has been killed.

Discussing accidents involving locomotives and mine cars, W. J. Schuster, safety director, Hanna Coal Co., St. Clairsville, Ohio, summed up efforts of his company to improve physical conditions in the mines. These improvements include, among other things, the following: (1) good track with sufficiently heavy rail, adequate drainage and ballasting and safe clearances; (2) heavier mine cars and locomotives with individually mounted wheels, which not only cling close to the rails but also add to efficiency; (3) proper roof support, with long-life main-line haulage entries gunited, thus providing safe roof and better illumination; (4) a complete signaling system, including manual and automatic signals, blocks, dispatchers and trolley-phones; and (5) redesign of locomotives to provide a shielded cab for the operator and trip-rider and storage space for auxiliary equipment, such as re-railers and jacks.

However, spending money to improve equipment alone will not solve the accident problem, Mr. Schuster contended, citing some disappointments that had come to his own company after putting in new safety equipment. Experience showed that "our problem was not a simple one but one which involved a continuous study of the work habits of each individual workman," he said. "Our safety program can be only as good as the broad picture of our industrial relations—the relations which exist between the workman and his foreman and his company." If workers respect their foreman and have confidence in his sincerity and fairness, efficiency will go up and the accident rate down. Hard work by the supervisors and the safety department, firm standards for the safe performance of individual jobs in the mine, an adequate training program for new men, the hourly and daily vigilance of trained supervisors and section foremen, who are without doubt the most important cogs in production and safety, and

the creation of right attitudes in workers—these things can guarantee that investments in safe equipment will pay off in higher tonnages and fewer accidents, Mr. Schuster concluded.

Use of shuttle cars has created a new safety problem in coal mining but the problem can be solved, said K. K. Kincell, superintendent, Mine No. 63, Consolidation Coal Co. (W. Va.), Fairmont, W. Va. Describing the nine-entry layout of Mine No. 63, the speaker pointed out that all doors are eliminated by the mining plan, though permanent stoppings are erected wherever needed. The five middle entries, two of which are used for haulage, carry intake air and the two outer entries on each side carry return air. With mining maintained on advance and retreat, crosscuts are made so that passage from one entry to another is easy, thus providing a choice of several escapeways in case of fire, Mr. Kincell pointed out.

To assure maximum protection against fires, shuttle cars carry rock dust and fire extinguishers and fire-fighting supplies and equipment are placed at known stations inside the mine, Mr. Kincell continued. To avoid pedestrian accidents, each car is provided with an alarm gong and always is given the right-of-way. In addition, translucent woven-glass drop curtains are used throughout the mine and all workers and equipment are required to carry a light at all times so that the shuttle-car operator can spot danger even behind a drop curtain.

To protect the operator and allow him to give all his attention to his shuttle car without being distracted by man-made hazards, good housekeeping is strictly enforced, Mr. Kincell said. This involves care that water lines do not protrude or hang down, gathering and storing post ends out of the way and keeping roadways free of debris and ruts. Pin timbering replaces posts on turns and at intersections, reducing the danger of knocking out a post in turning a corner, and may in fact be extended to all timbering along the shuttle-car haulageway for even greater safety.

Mr. Kincell also described a few changes in shuttle-car design made in the shop of Mine No. 63 to provide greater safety for the operator. Among these changes are dual controls, enabling the driver to face either way, and hand-holds welded to the side just above the driver's seat to enable him to stand safely when approaching or leaving the ramp. Other factors that boost safety are well-trained supervisors, good labor relations and adequate training for shuttle-car operators.

Concluding his address, Mr. Kinceli pointed out that although Mine No. 63 has had only two shuttle-car accidents in 18 months, the seriousness of those accidents points up the need of special planning to guarantee safe operation of shuttle cars.

Five out of eight fires occurring in

conveyor-belt mines in West Virginia were of electrical origin and the remaining three were due to mechanical trouble, said J. H. Hansford, director, mine safety and rescue, West Virginia Department of Mines, Charleston, W. Va. (*Coal Age*, July, 1948, p. 138). Major causes of the five electrically-started fires were poor housekeeping, which allowed oil drippings and coal dust to collect near cables and controls, and inadequate overload protection. Fires of mechanical origin were due mostly to improper splicing of the belt, which allowed drive slippage, thus building up friction heat to the ignition point of the oil drippings or coal dust.

Stressing the difficulty of escape from a conveyor mine in case of fire, Mr. Hansford recommended: (1) storage of fire-fighting materials underground to aid in "containing" fires; (2) frequent patrols of belts by supervisors or other competent men; (3) suspension of automatic sprinklers or rock-dust bags over drop points and belt drives; (4) use of fire-resistant cable insulation; (5) good housekeeping; and (6) improved ventilation and design of belt mines to provide adequate escapeways.

Reminding safety men that about one-half the fatalities and one-fourth the non-fatal accidents in bituminous mines are caused by falls of roofs or coal, G. W. Grove, supervising engineer, U. S. Bureau of Mines, Pittsburgh, declared that this aspect of mine safety is a serious challenge calling for a serious program of action. In Mr. Groves' absence, his paper was presented by T. C. Higgins, U. S. Bureau of Mines, Vincennes, Ind.

"Good roof is seldom if ever encountered," Mr. Grove contended, pointing out that most of the deaths and injuries due to roof falls are caused by wrong guesses about roof conditions, particularly secondary roof. The best method of roof testing yet discovered relies on the combined senses of hearing and touch, although recently there has been some promise that a reliable electronic method might be developed. At present, however, safety demands frequent roof tests, followed immediately by proper timbering or by taking down bad roof. Minimum timbering requirements must be enforced by supervisors, he insisted, and posts should not be removed until protection is provided for workers.

New advances in roof safety include a wider use of aluminum or steel posts and timbers, steel jacks, pin timbering and suspension roof support but additional safety devices will not take the place of proper timbering, Mr. Grove argued. Since the human factor is of major importance in mine safety, workers and mine officials must shoulder their responsibilities, must stop accepting roof falls as routine and must join in safety education. This program involves, among other things, reducing unsupported roof between the face and the loading ma-

chine to a minimum, care in removing posts to make room for the loading machine and a firm resolution to stop taking chances.

Much of the improvement in coal's safety record is due to safety education, better face supervision and better methods of roof support but new-type machinery already installed or under development, including the continuous mining machine, will require a new kind of roof support, according to Edward Thomas, mining engineer, U. S. Bureau of Mines, College Park, Md. These new machines, operating continuously, will need more room to work in and will set up vibration problems which, if not solved, will send the accident rate up again.

Suspension roof support (*Coal Age*, July, 1948, p. 87) may well be a big forward step in solving these problems, Mr. Thomas declared, warning, however, that this method is not suitable for all types of roof and should not be installed without competent advice and careful study of overlying strata.

Suspension roof support is based on the fact that reducing the span of a stratum, by driving a series of expansion hangers up through the roof and attaching bearing plates or channel irons against the immediate roof, increases the strength of that stratum and enables it to support the strata above, Mr. Thomas explained. Among the advantages cited for the method are: a clear working area; better ventilation because timbers and posts no longer interfere with air flow; convenient suspension points for trolley wire and safety lamps; less contamination of coal falls by roof falls; lower roof-support costs; and reduction of the number of roof falls. Mr. Thomas declared that no roof-fall fatalities have yet been reported in suspension-roof mines but emphasized that the method cannot be used to support old roof where sagging already has occurred and that, if used at all, it must be kept up close to the face.

Reciting his own company's experience with suspension-roof support in a mine with bad roof, James Gray, assistant manager of raw materials, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala., declared that in his company's mines there have been no failures in 18,000 linear feet of roof now supported by suspension. The method used by T.C.I. is to pin the roof going up in the room and to use conventional timbering on the open end and on the retreat. Roofs of air courses also are suspension-pinned, he added. Most roof accidents are preventable if proper precautions are taken, said A. R. Harris, safety engineer, The Philadelphia & Reading Coal & Iron Co., Pottsville, Pa. Needed precautions are the following:

1. Use of mining methods that permit maximum recovery of coal at minimum cost with maximum safety to workers. This is, of course, a flexible requirement, since no two mines have exactly the same conditions, but

whatever the conditions, these three factors must enter into all decisions on methods and layout.

2. Safety consciousness on the part of supervisors and workers, who should be kept alert by safety meetings, frequent joint discussion of mining conditions among supervisors and workers, and repeated roof tests.

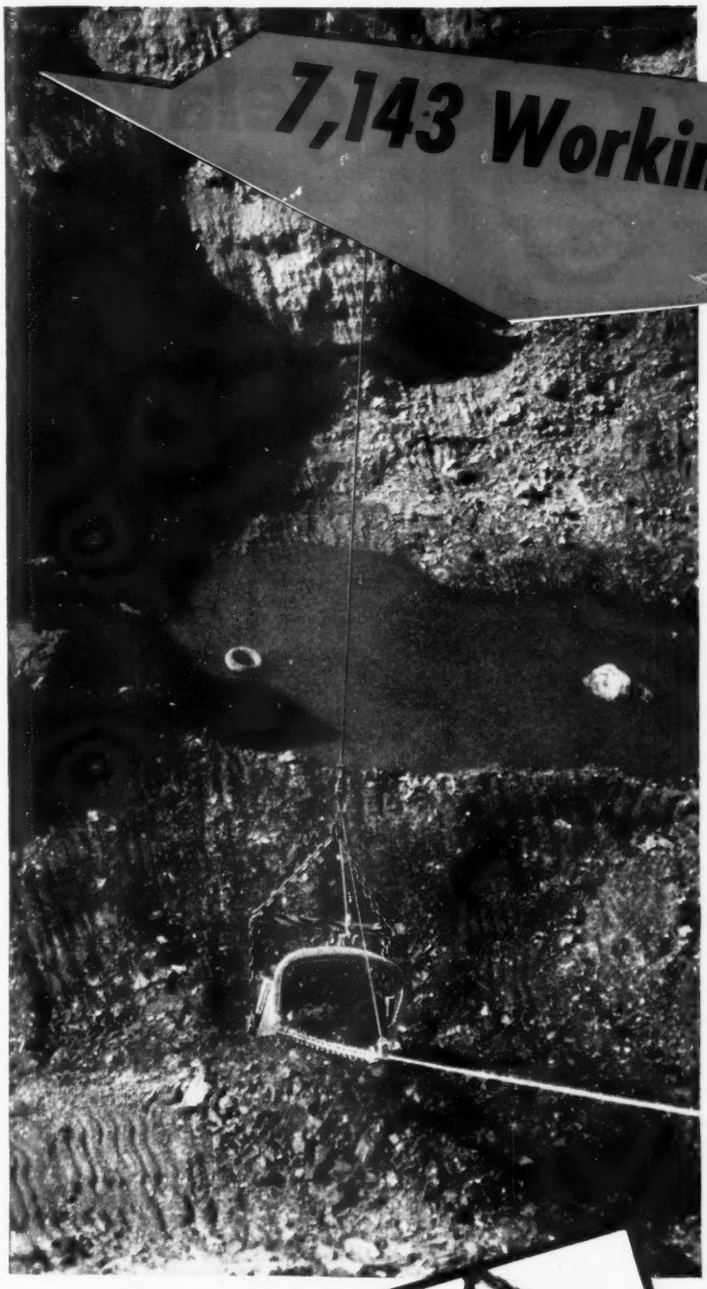
3. A sound timbering plan adapted to local mining conditions. This is of the utmost importance and must be strictly enforced and constantly re-examined for possible improvements. His company, Mr. Harris explained, forbids stretching prop centers beyond the maximum prescribed, requires forepoling ahead of timbers nearest the face and often demands that rails, suspended under collars on hangers overhead, be slid ahead after each cut, thus supporting a crossbar ahead of the inby posts.

Reviewing other threats to underground safety, Mr. Harris declared that workers who wear glasses at home and on the street should be required to wear them inside the mine, since good vision is important in detecting bad roof. Likewise, men who work underground should have good hearing. In fact, good vision and good hearing should be conditions of employment for underground work, he contended.

Concluding, Mr. Harris listed 13 ways to reduce the danger of roof falls, as follows:

1. Safety should be given due consideration when planning methods and sequence of mining.
2. Supervision and labor must cooperate in enforcing safety rules.
3. Timbering rules and safe practices must be strictly enforced.
4. Roof conditions must be studied carefully and frequently and timber placed promptly.
5. It should be remembered that no roof is good.
6. Miners with faulty vision should wear glasses on the job.
7. Special attention should be given to workers with poor hearing.
8. The sound-and-vibration method of roof testing, being the most reliable, should be used often.
9. Workmen and supervisors should be taught safety consciousness.
10. Discipline must be enforced.
11. Safety meetings should be held regularly.
12. Miners should be taught that if they want to live, they must learn.
13. Maintenance of safety standards means high productivity as well as fewer injuries.

How to increase the safety of fall-making was described by George H. Sambrook, safety director, H. C. Frick Coke Co. and U. S. Coal & Coke Co., Pittsburgh, who, explaining why it often is advisable to induce a fall, pointed out the following gains, among others: (1) it promotes free breaking of the roof strata; (2) it retards the projection of weight on pillars in advance of the fracture line; (3) it stabilizes the surrounding area



ESCO 9-yard stripping dragline owned by J. Robert Bazley, Inc., working at Logan stripping near Mt. Carmel, Penn.

7,143 Working Hours Old

and still on the job 3 shifts a day...

The *ESCO* dragline bucket shown at the left went into service in April, 1945. As of September 30, 1948, it had —

Operated 7,143 hours.

Moved 1,411,915 yards of original material.

Maintenance cost during this time averaged .00589 cents a yard. This record was made in the anthracite region of Pennsylvania where digging conditions are notoriously severe — *and the bucket is still operating three shifts a day.*

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Clean cutting lip for positive bite
Balance for smooth carrying
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Result: More payloads per pass, and more passes per hour.

ESCO dragline buckets are made in four types — medium, standard, stripping and heavy duty, in capacities ranging from 3/8 to 20 yards. One of these buckets will do your job faster and easier with less maintenance and "down" time. For specifications and other detailed information, see your nearest *ESCO* representative or fill in and mail the coupon below. Electric Steel Foundry, 2179 N.W. 25th Avenue, Portland, Oregon; 728 Porter Street, Danville, Illinois. Offices in Pottsville, Pa.; Eugene, Oregon; Chicago, Honolulu, Houston, Los Angeles, New York, San Francisco, Seattle, Spokane.

ESCO stripping dragline bucket, with manganese steel parts shown in red.

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DRAGLINE and DIPPER BUCKETS

and increases safety and coal recovery; (4) it promotes a more even discharge of gas from overlying areas and thus aids in ventilation; and (5) it saves money by permitting timbers to be recovered for re-use.

Tracing the six stages in the development of his company's present method of making falls, Mr. Sambrook described the procedure now in use, called the "sling-rope method," as follows:

1. Preparation for making falls, including the setting of center posts, removal of track, etc., is made immediately after loading is completed in the section, thus providing careful supervision by the foremen, maximum safety for the crew and favorable conditions for maximum timber recovery.

2. Steel rope slings, about 4 ft. in diameter, are looped over the rib side of those crossbars which can be recovered safely.

3. The master rope then is threaded through the slings, starting from the curve that leads into the section and extending to the inby timber to be recovered.

4. Cribs are taken out by an auxiliary cable attached to a locomotive, beginning with the inby crib to be recovered and continuing crib by crib.

5. The master rope, already strung through the loops on the cross-bars, then is attached to the locomotive and the crossbars are drawn out in a single operation.

Adding up the results of this method, Mr. Sambrook stated that there has been a 10 percent reduction in serious non-fatal accidents compared with the accident rate set under previous mechanical methods and a 100 percent reduction in fatal accidents; man-hours required to complete a fall have been reduced 50 percent; and recovery of material for re-use has been comparable to that in previous methods. The outstanding advantage of the new method is that it practically eliminates exposure of workers to a roof area that has been subjected to an extensive movement, he said.

The organization and purposes of the Health and Safety Division, U. S. Bureau of Mines, were outlined by J. J. Forbes, chief of that division, at a joint luncheon of the Coal Mining and Mining Sections on Wednesday. Stressing the importance of first-aid training as a step toward accident prevention, Mr. Forbes cited the growing number of first-aid classes taught by Bureau instructors, cooperation with the mining departments of several states, the renewal of Bureau-sponsored first-aid contests and the newly authorized Bureau award presented to any man who saves a life as examples of the Bureau's safety campaign. About 90,000 people have been trained in mine-rescue methods, he said.

Although much of the Bureau's program has been directed at mine officials and supervisors, the achievement of real safety demands that the

workers also be brought into the movement, Mr. Forbes pointed out. To this end, new stress is being laid on miner participation in the Bureau's program. The improvement in this year's safety record to date over last year's record is due partly to better and wider use of rock dust to prevent the spread of explosions, as well as to better inspection, wider training and more vigilance on the part of management and men, Mr. Forbes declared.

Enlargement of workmen's compensation, extension of the Federal Mine Safety Code and authorization for federal mine inspectors to close down a dangerous mine are new objectives of the U.M.W.A. in its campaign to improve mine safety, declared Paul K. Reed, international representative, U.M.W.A., and director, disability benefits section of the miners' welfare fund. Showing how the union has been in the forefront of the drive for safety since its beginning, Mr. Reed pointed to the union's share in setting up the Bureau of Mines; its appearances before federal and state legislative bodies in behalf of more safety laws, closer inspection of mines, increased ventilation, better control of explosives, proper drainage, better and more frequent tests for gas and improvement of unsafe roof conditions; its backing of workmen's compensation laws; its efforts in behalf of the Federal Inspection Act of 1941; its insistence upon inclusion of the Federal Mine Safety Code in the wage agreement; and its cooperation in the Joint Industry Safety Committee authorized by the 1947 agreement.

The U.M.W.A. always has backed mechanization of mines but, aware of new hazards created by machinery, has also demanded that safety advances keep pace with advances in mining methods, Mr. Reed declared. Further safety improvement, as new-type machines are installed, will require that inspections be made not only before each shift but also during shifts to check on roof and ribs, ventilation, gas, etc. Under this system, Mr. Reed contended, inspectors should be empowered to stop work in any place, section or mine. Duties of the inspector should be separate and distinct from the production of coal, he insisted.

Many coal-mining companies have gone far beyond any legal requirements to protect their employees and promote safety practices, declared Earl R. Maize, director, Safety Division, National Coal Association, who outlined the tasks ahead of the newly organized N.C.A. Safety Division and its activities in behalf of safety. The division's purpose is to coordinate the safety work of the bituminous industry by providing a medium for exchange of information and by advising with coal operators and state and federal departments.

Listing some of the projects of the division thus far, Mr. Maize cited the

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SCRANTON, PA.: Penn. Elec. Engineering Co.
WHEELING, W.VA.: Westinghouse Elec. Supply Co.
WASHINGTON, PA.: Fairmont Supply Co.
WILLIAMSON, W.VA.: Williamson Supply Co.

preparation of four safety posters available on request by operators; concrete backing of the U. S. Bureau of Mines' education program; promotion of a safety flag to be flown at each mine from the first of the month until the time of the first lost-time accident; and preparation of materials to be used in safety contests of various kinds in miners' homes, mining towns and mines.

Arguing that laws alone will not make the mines safe, Mr. Maize said that the Safety Division is placing its confidence in a long-range educational program that eventually will reach all men in the industry.

Explosions can be prevented if management plans, provides, inspects and maintains protective measures and if employees do not destroy, disturb or nullify the protective measures taken by management, said R. E. Kirk, manager of raw materials, Tennessee Coal, Iron & R.R. Co., Birmingham, Ala. In Mr. Kirk's absence, his paper was read by James Gray, assistant manager of raw materials.

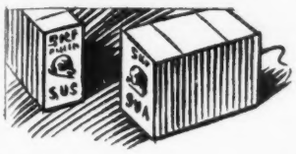
Successful techniques of preventing coal-mine explosions already exist but sincere and intelligent application of these techniques is needed, Mr. Kirk contended. Backing up his argument with quotations from official reports on explosions, he pointed out that non-permissible explosives still are being used; that permissible explosives sometimes are stemmed with coal dust, improperly stored or fired as open, unconfined shots; that ventilation often is not properly planned, haulageways are used for return air or intake air is conducted through or close to abandoned workings; that permissible equipment is not maintained in permissible condition; that mine maps are not kept up to date, allowing men to cut into large bodies of gas because they did not know exactly where they were working; that materials are not provided in sufficient quantities at the right times; that inspections are irregular or infrequent; and that inspection reports are not followed up by corrective action.

In the final analysis, it is performance that counts and "an alert management fulfilling its responsibilities is the major factor in preventing coal-mine explosions," Mr. Kirk concluded.

"The first requisite of a safe program is that the management must be 'sold' on the use and value of a real safety program," said J. D. Cooner, safety engineer, The Hudson Coal Co., Scranton, Pa., who outlined the foundations of safety engineering and a safety program at the final session Wednesday afternoon. Other requirements, Mr. Cooner declared, are the following:

1. The safety engineer and his inspectors should have worked in the mines as production workers and as officials.

2. Safety inspectors should be physically qualified to reach and in-



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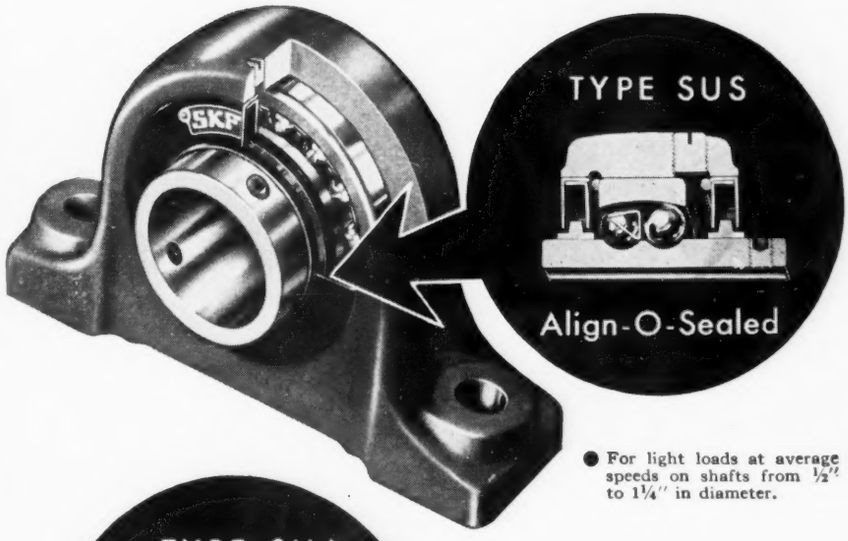

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spect all parts of the mine. Likewise, they should be young enough to have a future ahead so that there will be incentives for promotion.

3. Inspectors should be fair and cooperative and should keep their minds open for suggestions, though they should not be "yes" men.

4. Inspectors should be good writers and public speakers, able to get their points across to miners and management alike.

5. Inspectors should not be discouraged by streaks of bad luck or by the difficulty of getting their ideas across.

6. Safety inspections should be frequent and thorough.

7. Inspection reports should be sent through quickly.

8. New safety incentives should be substituted for those that grow stale.

9. The safety engineer should report directly to the operating head.

A properly planned and executed safety program will pay for itself in the prevention of human suffering of the worker and his family and at the same time will save the employer money in medical care, compensation and production. "It is my sincere belief that most accidents are man-made and can be avoided," Mr. Cooner concluded.

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Preparation Facilities

Elk Horn Coal Corp., Wayland, Ky.—Contract closed with Jeffrey Mfg. Co. for tipple equipment; capacity, 100 t.p.h., refuse.

Moffat Coal Co., Sparta, Ill.—Contract closed with Jeffrey Mfg. Co. for tipple equipment; capacity, 175 t.p.h., 6x0-in. coal.

Slab Fork Coal Co., Slab Fork, W. Va.—Contract closed with Jeffrey Mfg. Co. for unit washer; capacity, 150 t.p.h., 6x0-in. coal.

Youngstown Mines Corp., Dehue, W. Va.—Contract closed with Nelson L. Davis Co. for Heavy Media coal-processing plant; capacity, 350 t.p.h., run-of-mine; plus 4-in. coal to be reduced to minus 4-in., the ¼x0-in. to be screened out and the resulting 4x¼-in. to be processed in the Heavy Media system; plant facilities to include pre-sizing, crushing, loading and refuse disposal.

Cabin Creek Coal Co., Scotch Valley, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft.-diameter Wilmot Hydrotator to prepare stove or nut coal; feed capacity, 40 t.p.h.

Mt. Top Coal Co., Maryd, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft.-diameter Wilmot Hydrotator to prepare barley coal; feed capacity, 55 t.p.h.

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Get this Bonus...

50 to 100% longer tire life..

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WHEN you put Walter Tractor Trucks on your pit run, you soon discover money-making "extras" found in no other truck . . . resulting from the great power and super traction of the Walter 4-Point Positive Drive.

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ville, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft.-diameter Wilmot Hydrotator to prepare No. 4 coal; feed capacity, 25 t.p.h.

Capone Coal Co., Luzerne, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft.-diameter Wilmot Hydrotator to prepare nut coal; feed capacity, 40 t.p.h.

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Coal Publications

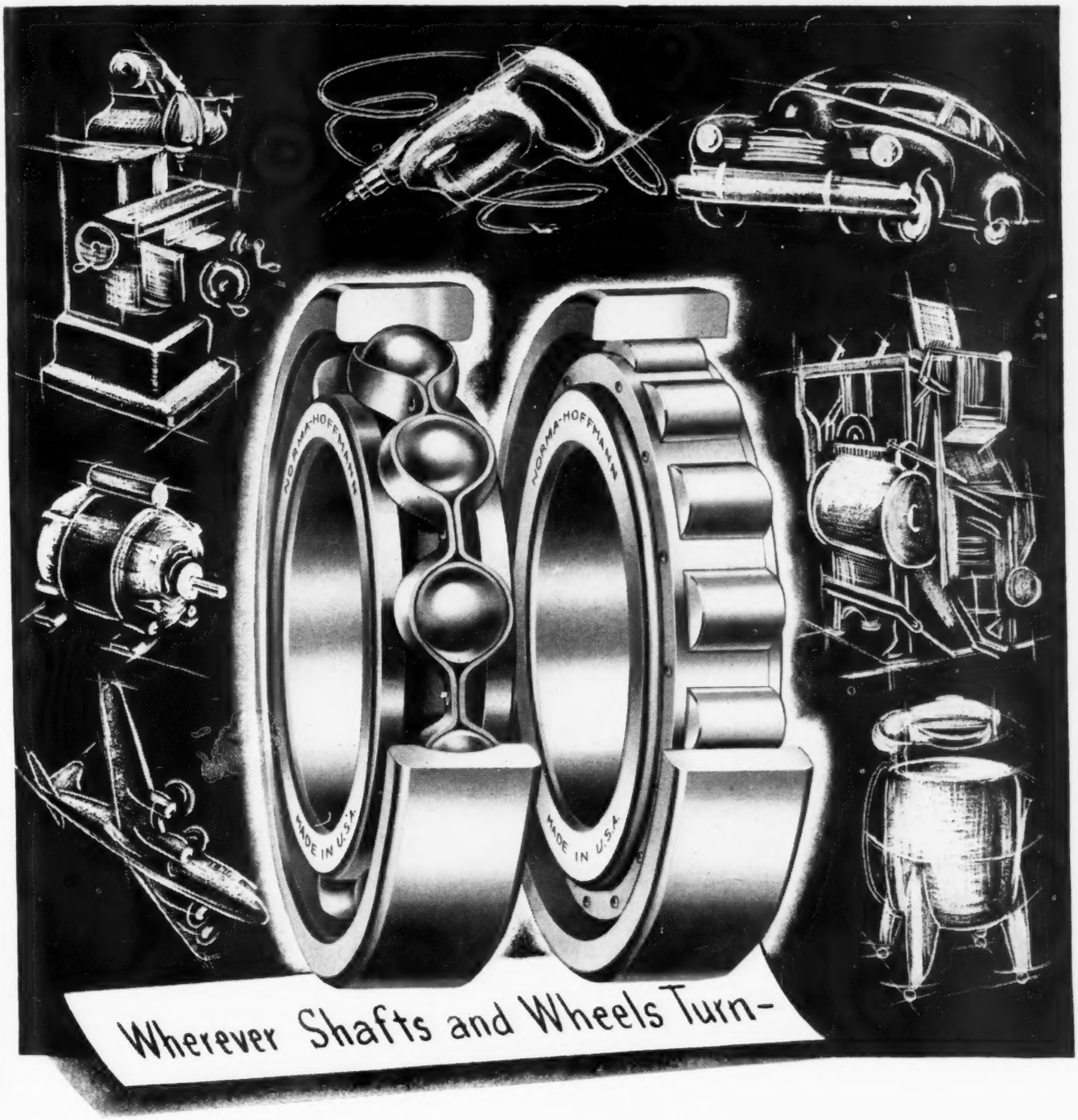
Analyses of Michigan, North Dakota, South Dakota and Texas Coals, by D. A. Andrews and J. W. Huddle. U. S. Bureau of Mines, T.P. 700. 106 pp. 5¾x9-in.; paper, 35c., Supt. of Documents, Government Printing Office, Washington 25, D. C. Description of fields, mining methods, production, distribution and use; analyses of mine, tipple and delivered samples.

Analyses of Complex Mixtures of Gases—Application to Control and Extinguish Fires and to Prevent Explosions in Mines, Tunnels and Hazardous Industrial Processes, by S. H. Ash and E. W. Felegy. U. S. Bureau of Mines, Bulletin 471. 202 pp. plus illustrations contained in book pocket. 5¾x9-in.; paper. 75c., Supt. of Documents, Government Printing Office, Washington 25, D. C. Calculation of factors affecting explosibility; construction and use of charts; examples of practical applications of diluting to combat mine fires.

Analyses of Kentucky Coals. U. S. Bureau of Mines, T.P. 652. 323 pp. 5¾x9-in.; paper. 40c., Supt. of Documents, Government Printing Office, Washington 25, D. C. Composition and quality of Kentucky coals, geologic structure of the various beds, mining and preparation methods and production, distribution and use.

Breaking Coal With Airdox, by J. S. Malesky. U. S. Bureau of Mines, I.C. 7480. 8x10½-in.; paper. Free, Publications Distribution Center, 4800 Forbes St., Pittsburgh 13, Pa. Description of Airdox operation. Advantages listed include elimination of spark and flame and absence of hazards from handling and storage of explosives and detonators.

Correlation of Domestic Stoker Combustion With Laboratory Tests and Types of Fuel: Effect of Coal Size Upon Combustion Characteristics, by R. J. Helfinstine. State Geological Survey, Urbana, Ill., R.I. 133. 47 pp. 6¾x10-in.; paper. Size range had little effect on performance of stoker coals tested except that smaller sizes burned at a more uniform rate. Addition of fines, which in some cases improved performance, suggests that public rejection of coal with large quantities of fines is based on prejudice or improper dust treatment.



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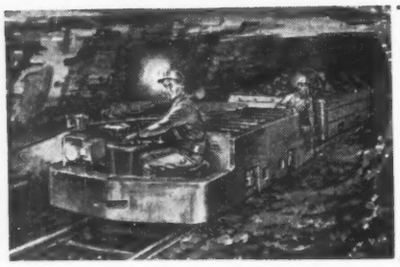
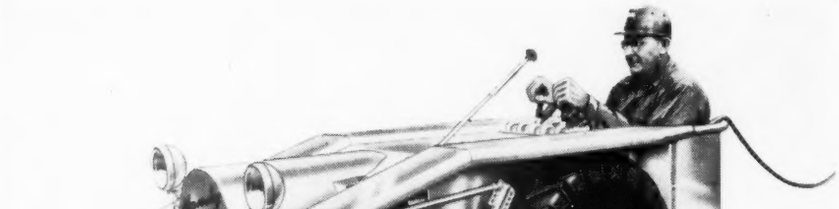
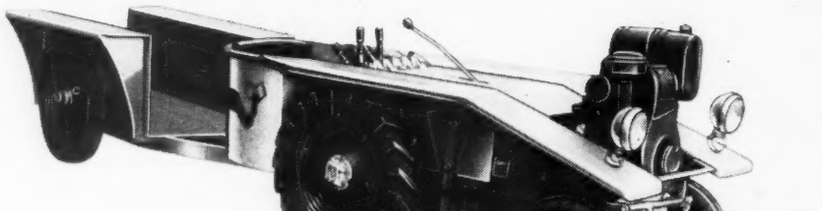


Equipment News

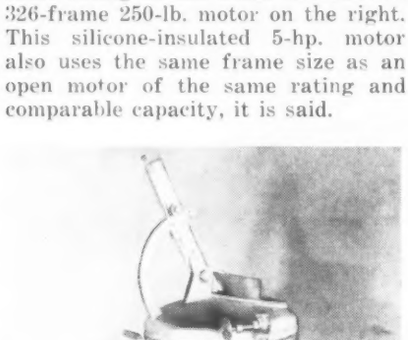
More Detailed Information and Descriptive Literature Normally Are Available on Request Directly to the Maufacturer

ELECTRIC MOTOR—Use of silicone resins for winding insulation and silicone grease for bearing lubrication now permit reduction of as much as three frame sizes from present standard Class A-insulated totally enclosed motors, according to the Westinghouse Electric Corp., Pittsburgh 30, Pa. The motor at the left, for example, is a Westinghouse 5-hp. 1,750-r.p.m. four-pole silicone-insulated totally inclosed all-steel Life-Line motor in the 254 frame weighing 145 lb. and has the same rating as the Class A-insulated 326-frame 250-lb. motor on the right. This silicone-insulated 5-hp. motor also uses the same frame size as an open motor of the same rating and comparable capacity, it is said.





UNDERGROUND AND SURFACE MODELS of a new "Handy Andy" angle dozer are being produced and distributed by the Central Mine Supply Co., Mt. Vernon, Ill. The underground unit (top) is electrically powered from a cable reel, requires only 31 in. of height, is 7 ft. long and has a 6-ft. turning radius, it is reported. It has three speeds forward and reverse, with a top speed of over 7½ m.p.h. A special tilting front axle and front-wheel steering is said to make for fast maneuverability. The surface model specially built for "jack-of-all-trades" duty is powered by a gasoline motor, is 3½ ft. high and 7 ft. long, and with its three speeds forward and reverse and 6-ft. turning radius reportedly handles clean-up work, backfilling, road maintenance, slag leveling, towing, pushing and various other jobs. The underground unit can be used to maintain shuttle-car roads, clean track, clean up after loaders and cutters, tow supplies and for many other tasks, the manufacturer states. Both units have a steel all-welded chassis, with hydraulic steering, brake and clutch controls. A black line on the synchronized right headlight that turns with the front wheels indicates the position of the wheels at all times.



GROUTING MACHINE—New low-pressure pneumatic grouter announced by Robert S. Mayo, Lancaster, Pa., is designed for pressures up to 100 lb. per square inch. The unit features a newly improved door that swings out of the way when it is being charged, together with a reduction in height of the machine without reducing its capacity, the manufacturer reports. The company's Bulletin No. 13 offers detailed information on the application of the unit.

ELECTRIC WIRE — "RoLene Weatherproof," a polyethylene-covered wire, recently announced by the Rome Cable Corp., Rome, N. Y., is said to offer moisture resistance, long life with no braids to festoon or rot, lighter weight and smaller diameter, plus resistance to abrasiion, sunlight and other weather hazards. Because of its lighter weight and smaller diameter, longer spans for the same loading conditions are possible, as compared with conventional fibrous braided types, the company reports. Various sizes and types of the new wire are available, states Rome Cable.

CRANE—With a safe-rated lifting capacity, on outriggers, of 45 tons at a 12-ft. radius, the new Lorain MC-820 Motor-Crane is reported by the manufacturer, the Thew Shovel Co., Lorain, Ohio, to be the largest of its kind in the world. It is equipped with two Waukesha diesel engines, one a 225-hp. unit driving the carrier at speeds up to 18 m.p.h., with five

Central Ohio Coal Company*
gets L-O-N-G-E-R service
from J&L *Precisionbilt* WIRE ROPE

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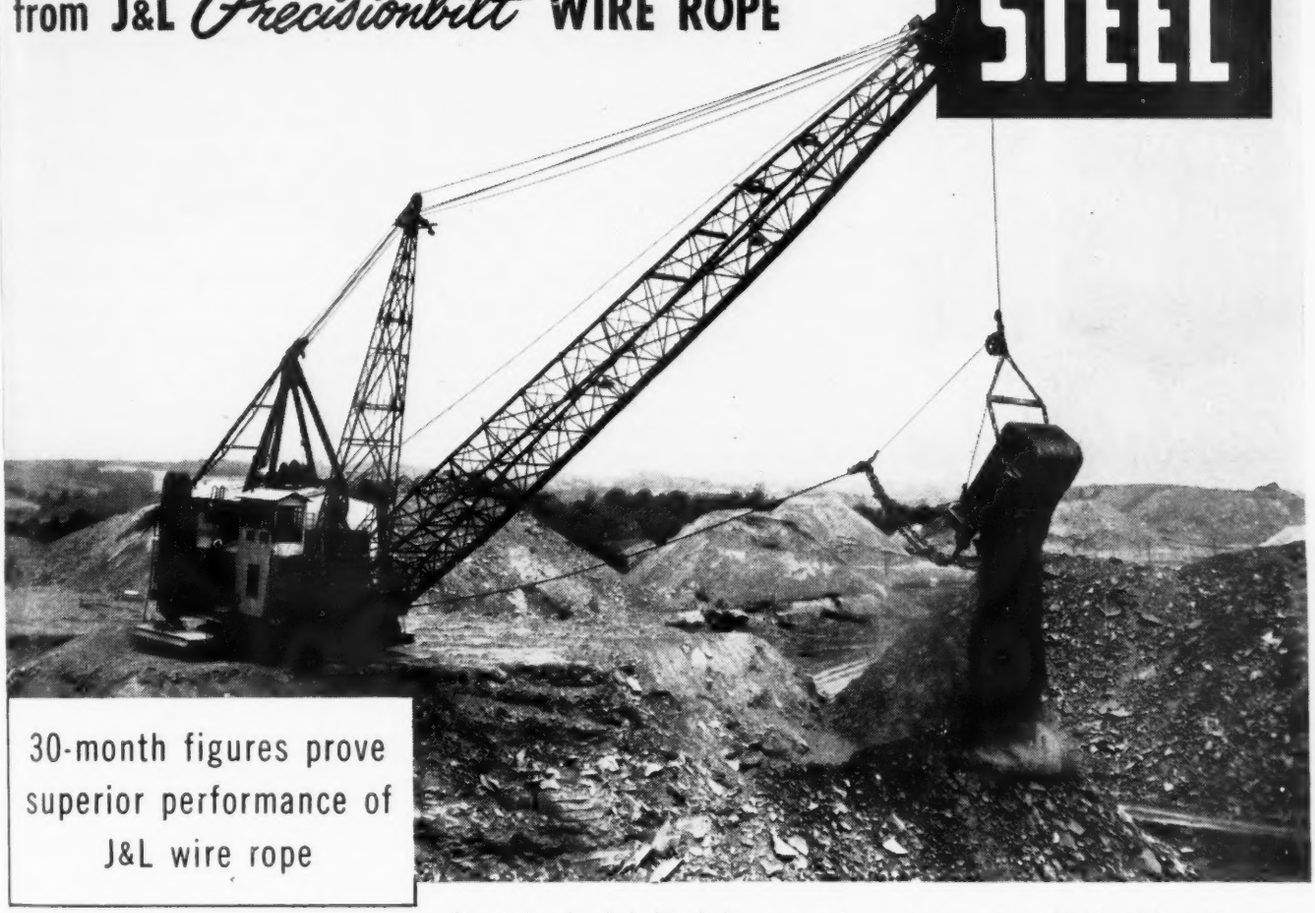

30-month figures prove superior performance of J&L wire rope

For two and one half years, Central Ohio Coal Company of Zanesville, Ohio, has kept detailed records on the performance of wire-rope hoisting lines, draglines and dump cables used in their strip-mining operations. These records prove that, among the several different brands used, J&L Wire Ropes gave *more days of service* and moved *more cubic yards of overburden.*

Here are the average performance figures:

Dragline—50% longer service life than competing wire ropes. (J&L Precisionbilt 2¼" dia. Type "U" Lang Lay)

Hoisting Line—30% longer service life than competing wire ropes. (J&L Precisionbilt 1¾" dia. 6 x 37 Lang Lay)

Dump Cable—More than twice the service life of competing wire ropes of ⅛" larger diameter. (J&L CenterFit 1⅛" dia.)

But it is what's behind these records that counts! Both J&L and Central Ohio "know their ropes." J&L knows how to build wire ropes and what type to recommend for every job. Central Ohio knows how to operate them for the longest and most profitable service. This means not only correct application, but also *proper, engineered care.*

—And what is "proper, engineered care?" Why not let a J&L Wire Rope service engineer tell you? He's a specialist in wire rope application. He knows how to get the most out of every inch of hoisting line, dragline, logging rope, marine cable, oil-country line—or wire rope in any other application.

If you would like to have a J&L engineer call on you, write us. The coupon is for your convenience.

Above—*Page, Model 627 S, Walking Dragline, with 12-1/2 yd. bucket. J&L Wire Rope for hoisting line, dragline and dump cable.*

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Gentlemen:

We are interested in learning how to get more service from our wire ropes. Please have a J&L engineer call on us.

Name.....

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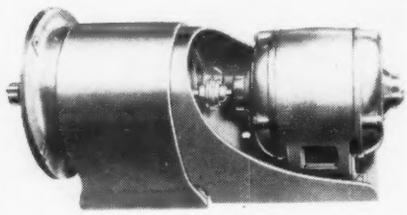
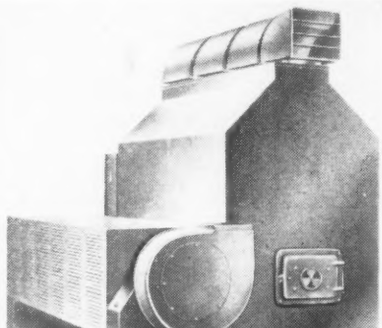
*Affiliated with Ohio Power Company in the American Gas and Electric System.

JONES & LAUGHLIN STEEL CORPORATION

forward and one reverse speeds, and the other powering the turntable. Standard booms are 50 ft. long and center section of various lengths are available to give a maximum boom length of 100 ft.



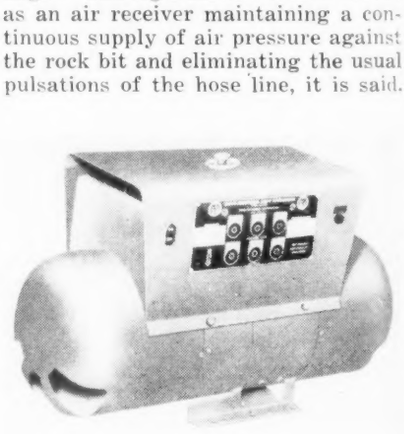
MOTOR REDUCER—The Falk Corp., 3001 West Canal St., Milwaukee 8, Wis., has announced a new line of all-steel "Motoreducers." Among the features cited is a lighter and stronger housing more adaptable to a variety of requirements and equipped with a new dirt-proof and moisture-proof seal. The line includes horizontal and vertical units in both integral and all-motor types for floor, wall or ceiling mounting. The basic unit can be converted to right-angle, V-belt, multi-speed, low-ratio, ceiling mount and other adaptations.



NEW COAL-FIRED warm-air space heater for industrial and commercial establishments, including coal-preparation plants, announced by Dravo Corp., Pittsburgh 22, Pa., supplements the Dravo "Counterflo" oil- or gas-fired heaters and can be converted for either of those two fuels. Said to be one of the first coal-fired heaters to successfully use a stainless-steel combustion chamber, which increases service life and eliminates a substantial amount of the customary side wall refractory, the new model is available in two output capacities: 1,250,000 and 1,500,000 B.t.u. per hour. It can be used with or without ducts and standard equipment includes a hopper-model bituminous stoker. Anthracite or bin-fed stokers also can be supplied. Operation of the fans and stoker are completely automatic, thermostatically controlled.

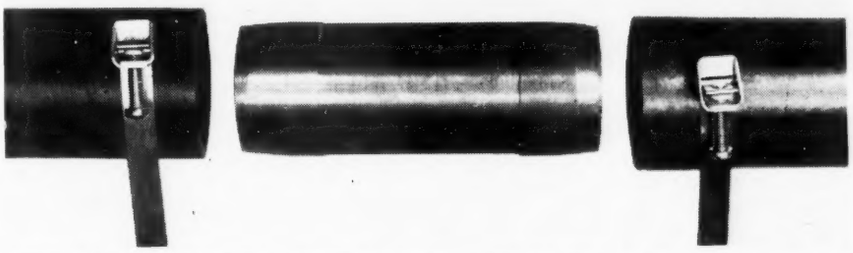
TUBING CLAMPS—Flexible Tubing Corp., Branford, Conn., has announced its new "Flexfast" low-pressure clamp for use with flexible conduits with diameters of 1½ to 37 in. Flexfast is said to combine an overlapping one-piece non-rusting metal clamping band with a strap and buckle take-up and requires no tools for quick and easy set-up or release.

WAGON DRILL—Independent Pneumatic Tool Co., Aurora, Ill., has announced a new Model BW-1 wagon drill equipped with the new Thor Model 105 1¼-in. drifter rock drill. The unit features a single reversible pneumatic motor that feeds and raises the drill, permitting throttle control of the feeding speed. Its mast can be swung 360 deg. vertically or horizontally for drilling of holes at any angle. The rig's tubular frame serves as an air receiver maintaining a continuous supply of air pressure against the rock bit and eliminating the usual pulsations of the hose line, it is said.

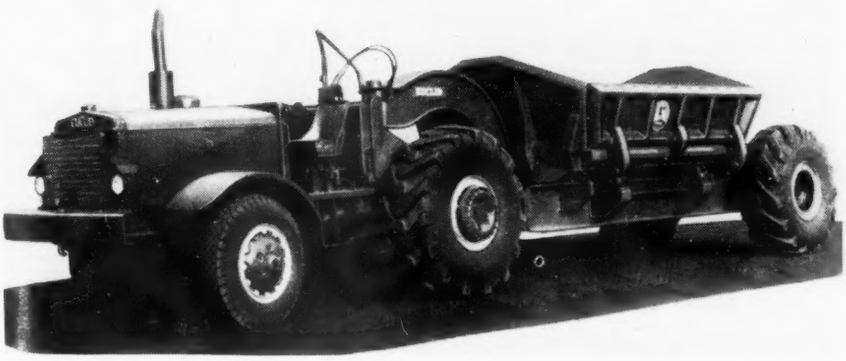


ARC WELDERS—A new group of a.c. and d.c. arc-welding machines in various capacities has been announced by the Metal & Thermit Corp., 120 Broadway, New York 5. The a.c. units are of the transformer type and include built-in power-factor corrector, fingertip stepless current control, fan-forced ventilation, wide current range and moderate open-circuit voltage operation, according to the company. Major design feature of the d.c. welder, which is available as a motor-driven or engine-driven unit, is a one-dial simplified control panel.

NEW BRATTICE CLOTH MADE OF "KOROSEAL" recently announced by the B. F. Goodrich Co., Akron, Ohio, reportedly will not burn except while flame is applied. It is said to be impervious to air, will not absorb moisture and become heavy, is resistant to acid mine water and atmospheric gases and offers excellent tear strength and abrasion resistance. Reinforced edges eliminate doubling over in installation, the company states. The new-type cloth is available in four widths, 36, 42, 48 and 54 in.



NEW LIGHTWEIGHT FLEXIBLE SYNTHETIC PIPE, said to be both acid- and alkali-resistant, has been announced by Carter Products Corp., Cleveland 5, Ohio. Known as "Carlon E," the new pipe is reported by the manufacturer to have an expected corrosion-free life of 20 years and retain its flexibility and toughness at temperatures from 50-deg. below zero to 100-deg. F Installation is reportedly simplified by its flexibility, which permits adjustment to varying floor heights, extensions around corners without using tees and coiling as necessary. A 200-ft. section of 2-in. pipe weighs only 100 lb. Only one coupling is needed for each 200-ft. section and the special plastic coupling available employs stainless-steel straps quickly fastened with a screw driver. Carlon E is available in seven sizes, from ½ to 6 in.



TRACTOR-TRAILER—Model FDT-98W side-dump unit announced by Euclid Road Machinery Co., Cleveland, Ohio, has a trailer of heavy welded construction with payload capacity of 40,000 lb. and a struck capacity of 13 cu. yd. Either right- or left-side dumping can be selected by the operator, with non-stop dumping of the load an additional feature cited. The tractor is powered by a 200-hp. diesel engine and offers a top speed loaded of 33 m.p.h.

Industrial Notes

The West Steel Casting Co., Cleveland, Ohio, has named Reginald G. Ullman sales manager. Before joining West Steel Casting in 1946, Mr. Ullman was associated for five years with The American Car & Foundry Co. in its Cleveland and Pittsburgh sales offices. Until his new appointment Mr. Ullman was active in sales development work for the company.

Euclid Road Machinery Co., Cleveland, has promoted V. L. Snow, formerly manager of sales development, to assistant sales manager. Mr. Snow joined the Euclid engineering department in 1935 and served as assistant chief engineer until 1942. R. M. Brown, a member of the department and also associated with Euclid since 1935, has succeeded Mr. Snow as manager of the sales development department.

Twin Disc Clutch Co. has elected as president of the company John H. Batten, formerly executive vice president. P. H. Batten, founder of the company, previously president and chairman of the board, will continue as chairman of the board of directors. The new president joined the company in 1935 and has held various positions in operating and managerial capacities since that time.

Caterpillar Tractor Co., Peoria, Ill., has appointed William Kusz, special representative since 1946, supervisor of industrial advertising, succeeding K. M. Emery, who has been promoted to supervisor of cooperative dealer advertising.

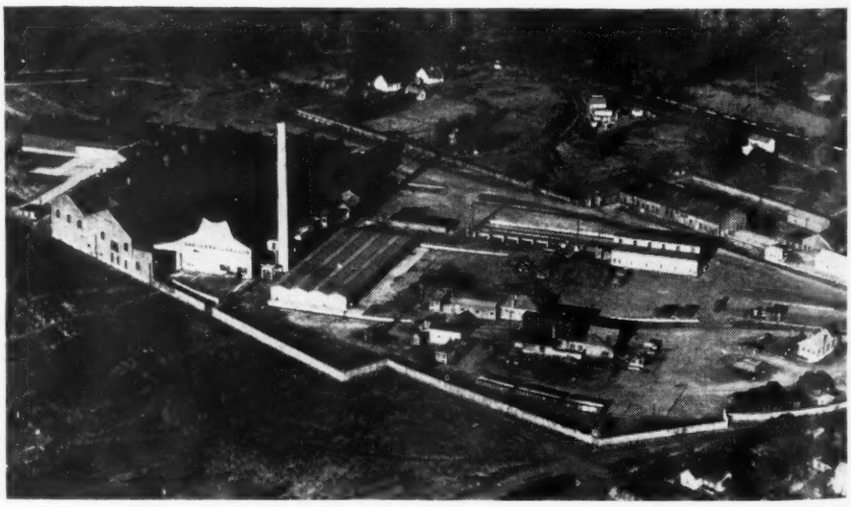
Union Wire Rope Corp., Kansas City, Mo., has named R. B. Boand, formerly district manager at Chicago, sales manager for its new machine-braided sling rope. D. B. Currence has been appointed Chicago district manager to succeed Mr. Boand. J. J. Lester has been made sales representative for the state of Oklahoma; L. A. Davis for the states of Montana, North Dakota, South Dakota, Minnesota and Wisconsin; and D. E. Bedford for Iowa and Nebraska.

Pittsburgh Gear Co., Pittsburgh, Pa., has named James M. Lawless as a sales representative to cover eastern, central and western Pennsylvania, eastern Ohio and northern West Virginia. George R. Hosey has been appointed to cover southern West Virginia, eastern Kentucky and Tennessee. William H. Brown has been made field sales and service engineer.

R. G. LeTourneau, Inc., Peoria, Ill., has named three district sales representatives as follows: Russell E. Dickerson, to cover Illinois, Indiana, Iowa and eastern Missouri, with headquarters in Peoria; Boze J. Livengood, for the states of California, Arizona and Utah, with offices in Los Angeles; and Kenneth R. Ross, for the states of Georgia, Alabama, Florida and Tennessee, with headquarters in Atlanta, Ga.

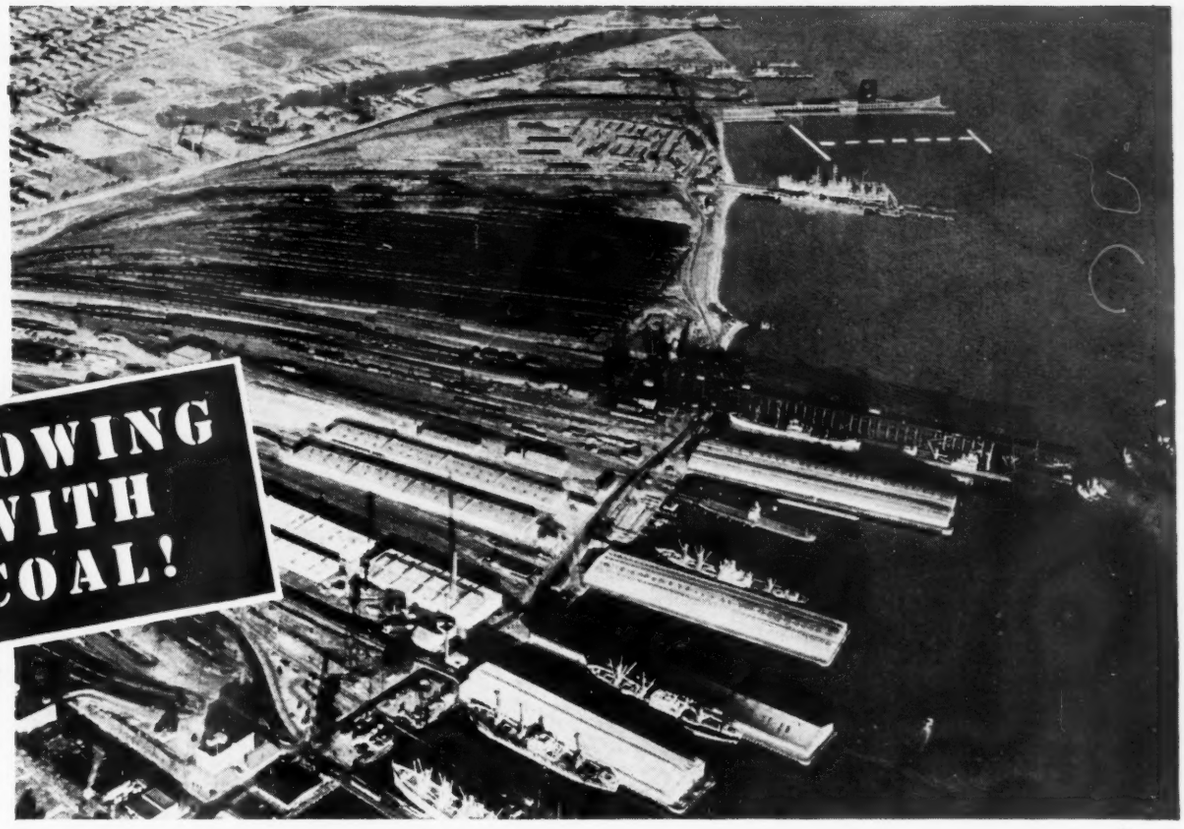
Link-Belt Speeder Corp., Cedar Rapids, Iowa, has appointed Robert B. Barnes sales manager, succeeding Hayes Parsons, retired.

American Car & Foundry Co., New York, has appointed Frank B. Powers assistant vice president, production



New Marion Branch Plant Begins Operation

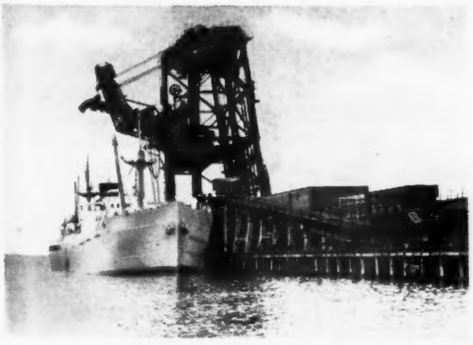
COMPLETION OF extensive construction and installation of facilities to utilize this recently acquired branch plant in Cambridge, Ohio, has been announced by the Marion Power Shovel Co. Two Marion Type 7200 walking draglines a month will be built in the plant, with production of the Type 7400 walking dragline added next spring or early summer. The new facilities, which include three manufacturing buildings and two warehouses totaling over 121,000 sq. ft. of space, will also handle pre-fabrication work for the company's main plant at Marion.



GROWING WITH COAL!

No. 7

COLOSSAL . . . is the word for



C & O's Coal Expansion Program

C&O is spending more than $5,000,000 on an expansion program at its Newport News terminal to practically double the coal dumping capacity at that point. Erection of the new low-level coal pier means that approximately 2,000,000 tons of coal can be handled at Newport News each month.

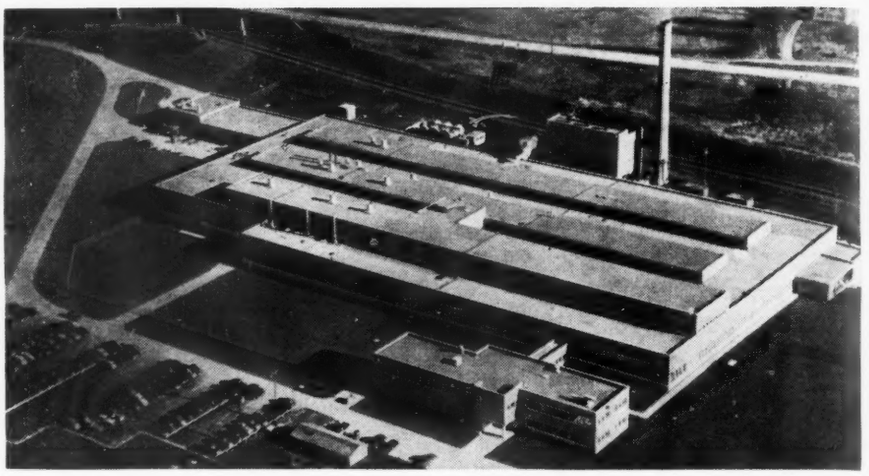
This new coal pier is only a small part of C&O's current program of improvements to road property and equipment estimated to cost over $150,000,000 — an extensive program that includes enlargement of classification and assembly yards at Russell, Kentucky; Toledo, Ohio and Shelby, Kentucky; new running tracks, signals and the installation of Centralized Traffic Control at several locations; additional coal cars and coal-burning locomotives; and seventy-five miles of new railroad lines into new coal fields. Yes . . . Colossal is the word for C&O's expansion program for King Coal!

- **This gigantic new low-level pier (located between the two present coal piers, as shown in the photo above), will be capable of dumping a maximum of 6000 tons of coal an hour and loading four ships at the same time. It will begin operation in January, 1949.**
- **The unique conveyor system employed at the pier will make possible a continuous flow of coal. Separate conveyors will feed four moveable towers mounted on as many tracks. The combined length of the conveyors will be more than two miles.**
- **The towers may be moved from hatch to hatch making it unnecessary to move a ship from the moment it reaches the loading pier until it is fully loaded.**

C AND O

CHESAPEAKE & OHIO RAILWAY

Largest Originating Carrier of Bituminous Coal in the World



American Brake Shoe Opens New Foundry

NEWEST OF the American Brake Shoe Co.'s six postwar plants is this non-ferrous foundry recently completed for its National Bearing Division at Meadville, Pa. With a total of 185,245 sq. ft. of floor space and the latest in equipment and facilities, the new plant is reported to offer greater production capacity than the four operations recently closed which it replaces and will permit concentration of production for the eastern area in one plant. Complete machining facilities under the same roof is one of the outstanding features of the new plant.

department. Mr. Powers was formerly vice president in charge of engineering, Baldwin Locomotive Works, Philadelphia, Pa. R. M. Hoel, sales agent for the company, has been transferred from the Pittsburgh to the New York District office.

Pennsylvania Refining Co., Cleveland, has appointed several new sales representatives for Penn Drake "Gumout." Hattendorf Sales Co., Atchison, Kan., will represent the company in Missouri, Kansas, Iowa and Nebraska. General Sales Associates, Nashville, Tenn., will take charge of sales in Tennessee, Alabama and Mississippi.

The Electric Storage Battery Co., Philadelphia, has elected Roland Whitehurst, formerly Exide sales manager, vice president in charge of sales for the company. Mr. Whitehurst, associated with the company for 40 years, succeeds Frank T. Kalas, who has retired after 49 years of service.

National Mine Service Co., Beckley, W. Va., has reported that its recently established Western Kentucky division is now in full operation, with offices and warehouse located at 132 East Center St., Madisonville, Ky. The new division, under the supervision of Louis W. Huber, vice president, and Phillip L. Hubbert, is the fifth set up by the company.

Trade Literature

Available Without Charge on Request to the Manufacturer

POWER DISTRIBUTION — Mines Equipment Co., Dept. 2, 4215 Clayton Ave., St. Louis 10, Mo. Bulletin No. S.C.C. 100 describes newest models and applications of Mines Equipment "Safety Circuit Center" portable elec-

This little Bit goes a long way

Actual operating records prove Bowdil Concave Cutter Bits give 15% to 20% longer life than ordinary bits . . . plus important power savings. The concave face permits Bowdil Bits to function efficiently when worn down 25% farther than others without increasing power demand or percentage of dust. Some users report cutting 3 to 5 more places with 25% to 30% more coarse cuttings.

Made of special alloy steel and heat treated by the most modern methods to hardnesses best suited to your cutting conditions, Bowdil Bits are available in special shapes, cutting face contours and clearance angles to fit your needs. A nearby Bowdil Service Man or Representative will be pleased to give you further information. Write for our latest bulletins on Bowdil Mining products.

BOWDIL

COAL CUTTING EQUIPMENT

CANTON OHIO

trical power hook-ups. Several pages illustrate, with actual cross-sectional layouts of modern mining techniques, applications of the unit in mechanized and conveyor mining.

COAL PREPARATION — Nelson L. Davis Co., 343 South Dearborn St., Chicago 4. Catalog No. 148, "Heavy Media Float and Sink Processor for the Coal Producing Industry," outlines the development, results and application of the Heavy Media Process to cleaning of various coals. Typical installations and flowsheets are illustrated.

STORAGE BATTERIES—The Gould Storage Battery Corp., Trenton, N. J. Bulletin No. GB-781 on storage batteries for mine locomotives and shuttle cars provides illustration, description, and full technical data on the Gould "Thirty" and "Kathanode" type batteries. Engineering specifications, capacities and other detailed information are offered.

EARTHMOVING — LaPlant - Choate Mfg. Co., Cedar Rapids, Iowa. New color-sound movie entitled "Profit Report" shows various job applications of the company's high-speed, rubber-tired unit, the TS-300 Motor Scraper. The 22-minute picture can be viewed at the firm's distributors and also is available from the company for loans to schools, clubs or other organizations.

UNIT SUBSTATIONS—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 11B6895 is a planning and engineering guidebook prepared to simplify and speed the layout of A-C load-center unit substations ranging from 100 to 2,000 kva. and includes dimensional and arrangement information, data on incoming line equipment and sizes and arrangements of feeder switchgear. Use of the booklet with A-C Bulletin No. 11B6325A, "Check List to Simplify Unit Substation Planning," is suggested by the company.

WELDING HOSE — Hewitt Rubber Division, Hewitt-Robins, Inc., Buffalo 5, N. Y. Bulletin outlines the simple and quick methods of installing and handling Hewitt Rubber's patented "Twin-Weld" welding hose, said to be a "double-barreled" unit, made up of two lines of high-quality, cord-reinforced welded hose molded side by side in one complete unit to eliminate the need for makeshift taping of individual lines and sprawling of separate units.

DIESEL ENGINES—Industrial Power Division, International Harvester Co., 180 North Michigan Ave., Chicago 1. Bulletin No. A-54-LL presents the design features, specifications, applications and work capacities of six International diesel engines, from the 39-hp. UD-6 to the new 180-hp. UD-24.

HARD-FACING—Stoody Co., Whittier, Calif. Bulletin provides details on properties, welding characteristics, typical uses, sizes and prices of two new hard-facing electrodes, Stoody Self-Hardening 21 and Stoody 1027.

FLEXIBLE TUBING AND HOSE—Pennsylvania Flexible Metallic Tubing Co., 72 St. and Powers Lane, Philadelphia 42. Bulletin No. 52-9 illustrates and describes the properties, construction and application of "Penflex" flexible galvanized steel hose and bronze steam hose. Additional bulletin outlines applications of Penflex tubing, hose and other products.

SUBSTATION TRANSFORMERS—Allis-Chalmers Mfg. Co., Milwaukee, Wis. Bulletin No. 61B6014A covers the construction details, specifications and performance features of A-C substation transformers for rural and industrial service in ratings from 50 to 500 kva.

ALLOY CASTINGS—The International Nickel Co., Inc., 67 Wall St., New York 5. Booklet, "Nickel Alloy Steel Castings in Industry," illustrates and discusses the application of these prod-

Resistor FAILURES COST MONEY!

LOST MACHINE TIME...

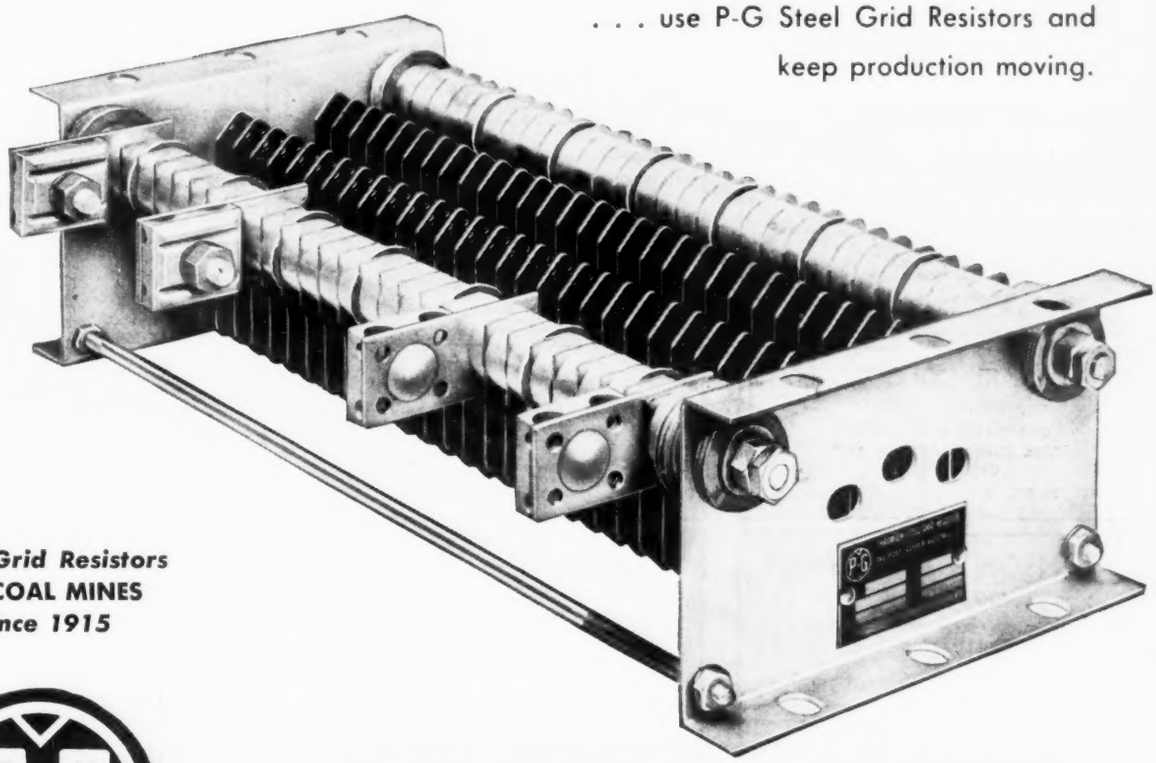
DAMAGE TO MOTORS...

DAMAGE TO CONTROLS...

COST OF NEW RESISTORS...

P-G *Steel Grid Resistors* REDUCE THIS COST...

Steel and mica construction with provision for expansion, enable P-G Resistors to withstand many factors frequently causing resistor failure. By fewer failures, P-G Resistors minimize the effect of lost machine time and expensive electrical maintenance. Be protected . . . use P-G Steel Grid Resistors and keep production moving.



Steel Grid Resistors
for COAL MINES
Since 1915

P-G

The Nonbreakable Steel Grid Resistor

THE POST-GLOVER ELECTRIC COMPANY

•ESTABLISHED 1892•

221 WEST THIRD STREET, CINCINNATI 2, OHIO

ucts to mining and a number of other industries. Detailed information on composition, specifications and properties is provided for the many applications shown.

MAGNETIC PULLEYS—Dings Magnetic Separator Co., 4740 West McGeogh Ave., Milwaukee 14, Wis. Catalog No. C-1001A describes the purpose, operation principle and advantages of Dings electromagnetic pulleys, including air-cooled pulleys, solid-type pulleys and waterproof, greaseproof or heatproof special pulleys. Catalog No. C-1007A details the features, application and specifications of the newly developed Perma-Pulley.

DRILL BITS—Anton Smit & Co, Inc., 333 West 52 St., New York 19. Booklet, "Diamond Drilling Bits," describes and illustrates the ASCO line of diamond drill bits designed for various types of drilling, and includes sizes, specifications and prices.

FLOOR MAINTENANCE — Stonhard Co., Dept. CA, 1306 Spring Garden St., Philadelphia 23, Pa. Bulletin outlines the use of Stonhard Stontop on new or old concrete floors, to reduce dusting, make floors harder and resistant to abrasive wear and liquids.

EARTHMOVING—R. G. LeTourneau, Inc., Peoria, Ill. Bulletin No. TP-163 lists complete specifications for the new B Tournapull and explains its features and operation. Bulletin No. TD-119 covers the features of size, power and speed available in the B Tournadozer, with an outline of the basic specifications and advantages.

WIRE ROPE AND SLINGS—L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa. Bulletin describing the company's stocks of standard wire rope and slings is accompanied by a 12-page inventory booklet that lists the exact quantity in stock, complete description and length of each item, and unit price on the wire rope, wire-rope slings and assemblies.

MAGNETIC STARTERS—Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y. Bulletin No. 4110 describes and illustrates the company's new line of a.c. magnetic starters of the across-the-line, non-reversing type. Applications, size classification, construction features, enclosure dimensions and other data are included.

STEELS—Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore. Bulletin No. 168, "Esco Stainless and High Alloy Steels," offers a comprehensive listing of Esco products in the specialty processing equipment field, which are said to include a wide range of products for use where unusual corrosion, heat or abrasion are involved.

TRANSFORMERS — Allis - Chalmers Mfg. Co., Milwaukee 1, Wis. Bulletin No. 61X7088 covers the installation, care and operation of dry-type transformers and includes maintenance hints, accessories and equipment and typical wiring diagrams for thermal control equipment. Six available terminations and high-voltage switch arrangements are shown. Bulletin No. 61B6043A outlines the use of "Chlorextol," a synthetic, non-inflammable, non-sludging insulating liquid of high dielectric strength, as an insulating medium for A-C transformers for all types of service.

WELDING EQUIPMENT — Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif. Catalog No. 20B illustrates and describes a large portion of the Victor line of gas-welding and flame-cutting apparatus, including complete units, torches, nozzles, tips, cylinder controls and other equipment.

POWER FACTOR—Electric Machinery Mfg. Co., Minneapolis 13, Minn. Booklet No. 200-TEC-1077, "Power Factor and What to Do About It," explains the essentials of power factor in industrial plants and gives a digest of power-factor calculation, why low power factor should be corrected and how it can be done.

WELDING BRANCH PIPE OUTLETS—Bonney Forge & Tool Works, Allentown, Pa. Catalog, "Bonney WeldOlets for Branch Pipe Outlets," presents complete information on how WeldOlet fittings reduce piping costs, and includes detailed data on the three types available. The various drop-forged flanges in the Bonney line also are described.

STEEL PRODUCTS—L. B. Foster Co., Electric Bldg., Houston 2, Tex. Bulletin offers a general description of Foster pipe, steel sheet piling, rail and track accessories, with separate folders available on each product offering more specific information.

STEEL BARS—Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80. Bulletin on cold-finished steel bars contains a description of the finishing processes, guide to selection, AISI and SAE standard of steel compositions, table of average mechanical properties, and a condensed listing of the analyses, finishes and shapes carried in stock.

PUMPS—Roy E. Roth Co., Rock Island, Ill. Bulletin No. 101 describes Roth heavy duty flexible coupled pumps, special metal pumps, and a series of industrial pumps and includes general catalog data, specifications, selection tables and prices. Bulletin No. 103 describes the company's new "Monobilt" pump, which combines pump and motor into one compact unit.

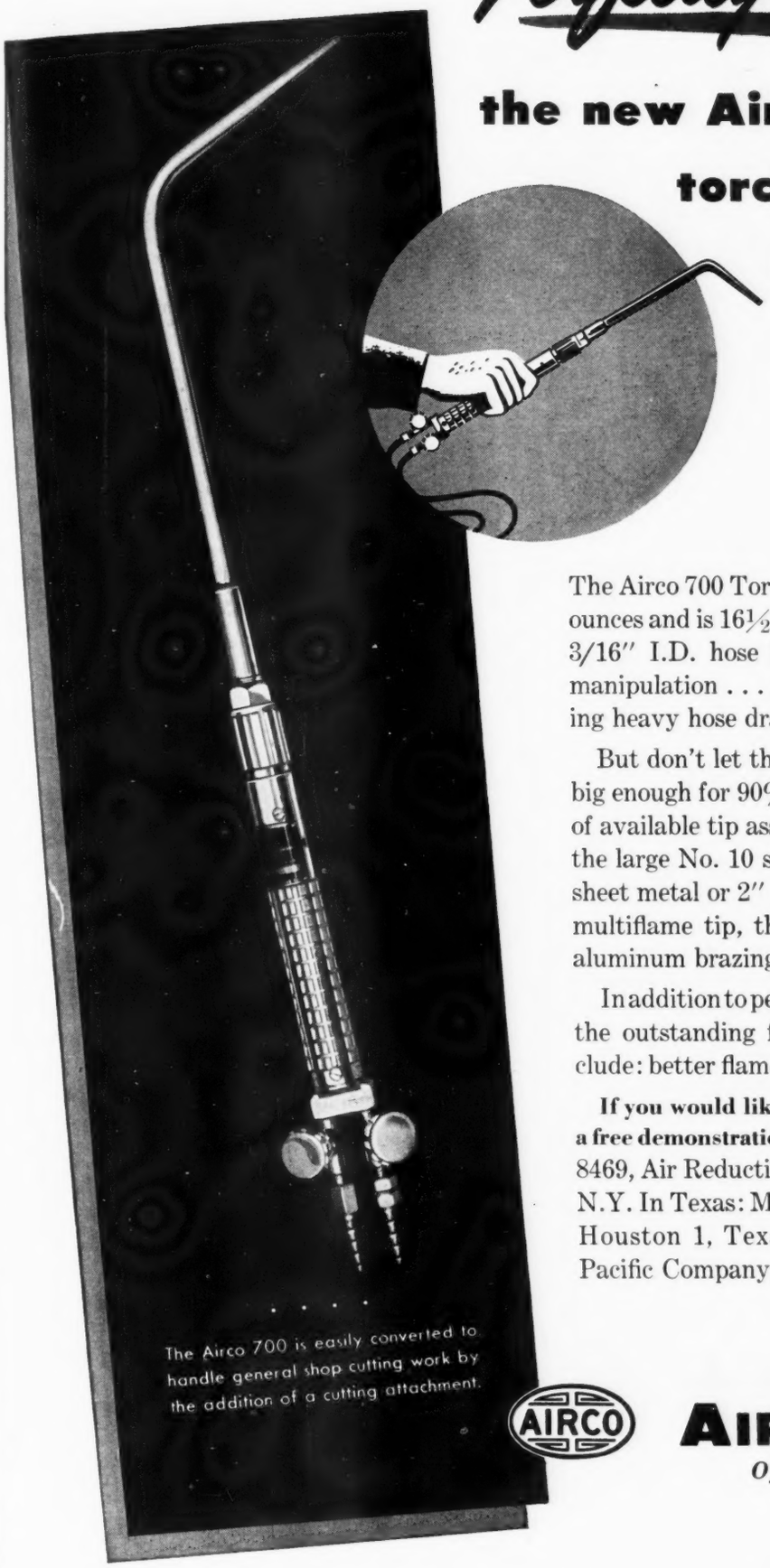
MOTOR BRUSHES—National Carbon Co., Inc., 30 East 42 St., New York 17. Catalog Section No. B-2106 describes a method of standardization of carbon, graphite and metal-graphite brushes for motors and generators by conversion from a great number of custom-built, individually ordered brushes with random specifications to a smaller number having predetermined and unified specifications, made possible under National Carbon's simplified RC number system.

PROTECTIVE COATINGS—Tar Products Division, Koppers Co., Inc., Pittsburgh 19, Pa. Bulletin, "Koppers Industrial Protective Coatings," discusses the features and application of cold-applied protective coatings especially designed to prevent corrosion and deterioration, and offers information on surface preparations, coating thickness, methods of application and types of coatings available.

DUST FILTERS—The W. W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio. Bulletin No. 98, "Industrial Dust Control," contains information on the basic principles that apply to the control of dust in industrial plants. Detailed engineering information, with applications, dimensons and capacties of Sly dust filters, is included.

Perfectly Balanced...

the new Airco 700 Welding torch cuts operator fatigue to minimum



The Airco 700 is easily converted to handle general shop cutting work by the addition of a cutting attachment.

The Airco 700 Torch (with a No. 5 tip) weighs only 19½ ounces and is 16½ inches in length. Lightweight, flexible 3/16" I.D. hose insures perfect balance and ease of manipulation . . . reduces operator fatigue by eliminating heavy hose drag.

But don't let that "light look" fool you; the "700" is big enough for 90% of your welding work. A wide range of available tip assemblies ranging from size 00 through the large No. 10 size makes it suitable for welding thin sheet metal or 2" thick sections. When equipped with a multiflame tip, this torch has no equal for silver and aluminum brazing.

In addition to perfect balance and wide operating range, the outstanding features of the NEW "700" torch include: better flame control . . . and low maintenance cost.

If you would like more information about this torch or a free demonstration right in your own shop, address Dept. 8469, Air Reduction, 60 East 42nd Street, New York 17, N.Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

AIRCO

AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

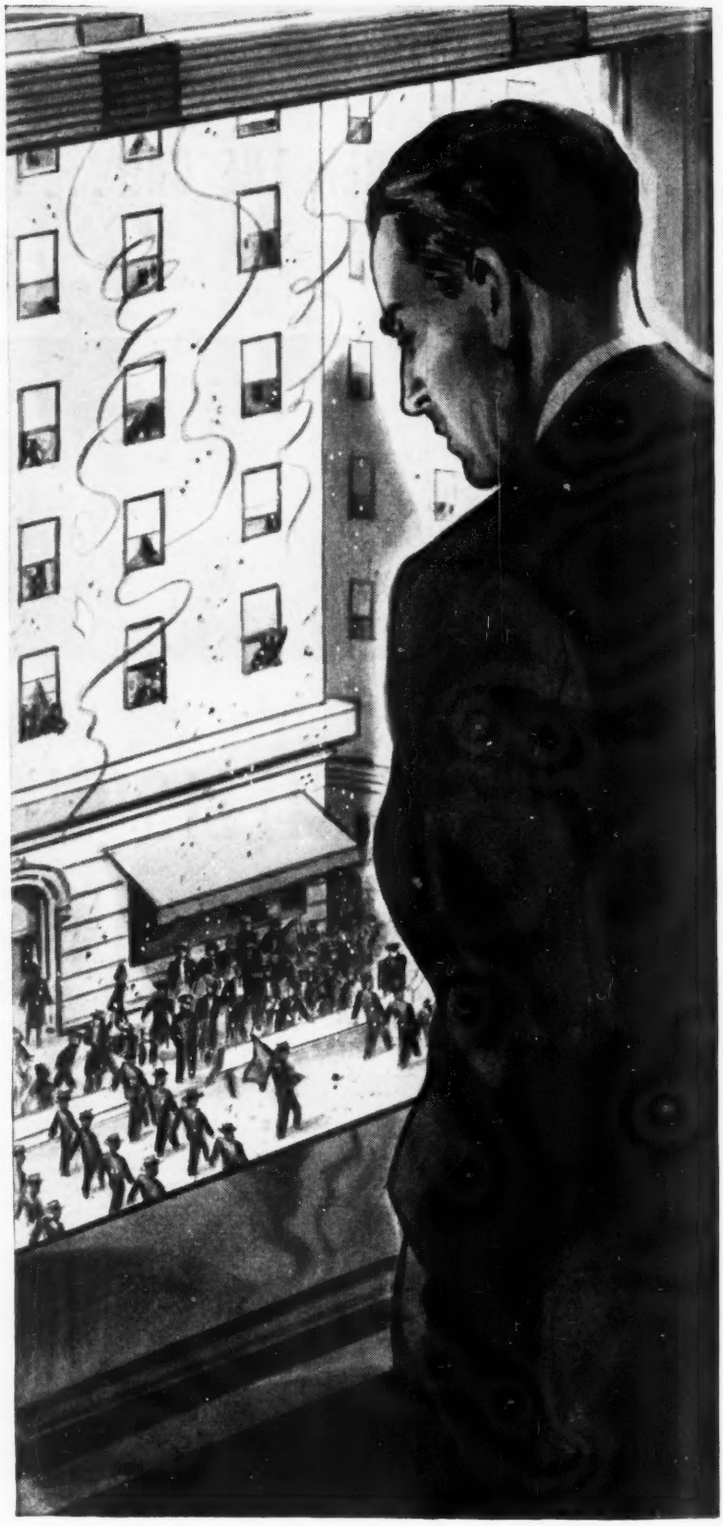
MEMO TO PRESIDENTS WHO WATCHED THE BAND GO BY!

HERE'S ONE parade that isn't "all over but the shouting" after the band has passed. It's the Payroll Savings Plan for the regular purchase of U. S. Security Bonds by employees.

Though the formal spring campaign to sell Bonds is over, any company can still move forward with the parade. Right now thousands of companies are putting *additional push* behind their Payroll Savings Plans. Managements of many companies that have not yet participated are *now installing* the Plan.

It's a "look-ahead" plan, that benefits employee, company, and nation. Every $3 invested in Bonds pay $4 at maturity. Personnel records in the plants with active P. S. P.. programs show improved employee attitudes—evidenced by less absenteeism and fewer accidents—as the individual's sense of security grows with Bond purchases. And every Security Bond dollar built up in the Treasury retires a dollar of the national debt that is potentially inflationary. It means less bidding-up of prices. Moreover, Bond buyers are better citizens because they have a tangible stake in the nation's future.

It's just as easy to take action now as when the campaign was at its height. Just call your Treasury Department's State Director, Savings Bonds Division, and ask for the material that helps to get a Payroll Plan started or to keep it rolling.



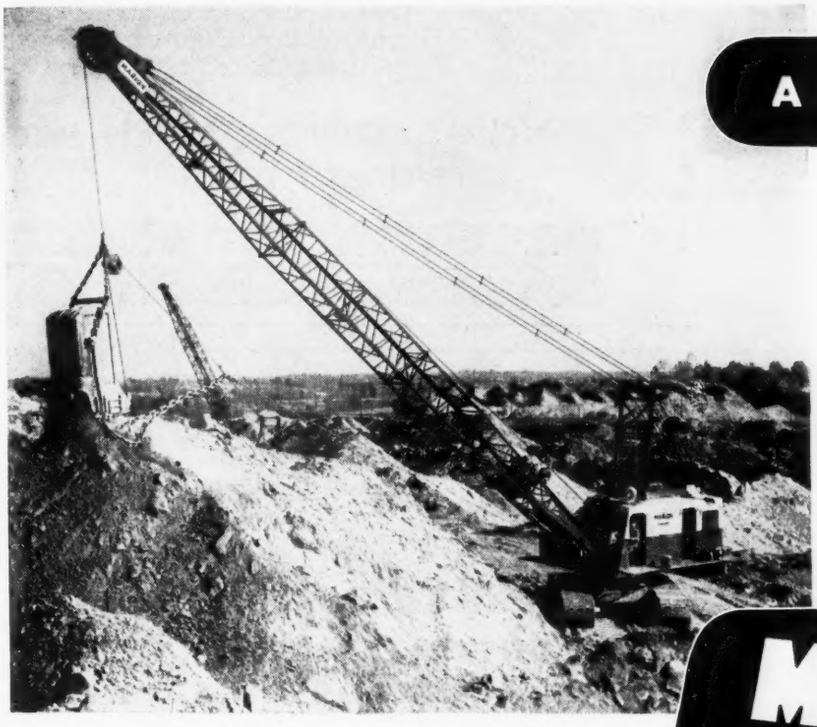
The Treasury Department acknowledges with appreciation the publication of this message by

COAL AGE

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

AS A HIGH LIFT SHOVEL

The fast and powerful MARION 111-M Diesel machine with Ward Leonard swing, and air control, can't be beat. It handles deep overburden easily and economically. Big yardage at low cost is its record.



AS A DRAGLINE

The new, big MARION 111-M is right-at-home in dragline service. It is a well-balanced machine that does big things with a 4 yard bucket and a long boom. It is fast, maneuverable, built for heavy material handling... easy to operate.

Write for bulletin describing this remarkable machine.

A NEW, BIG, POWERFUL DIESEL MACHINE WITH WARD LEONARD SWING AND AIR CONTROL

MARION 111-M 3-4 cu. yds. ... Is tops!

From 3/4 Cu. Yd. POWER SHOVEL COMPANY MARION SINCE 1884 To 40 Cu. Yds.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

Offices and Warehouses in all Principal Cities

Parmanco

MECHANICAL FEED HORIZONTAL DRILL. WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminate costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

Georgia-Pacific Plywood & Lumber Co.

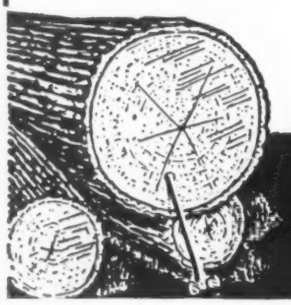
Augusta, Georgia

MINE TIMBERS
FOR ALL MINE USES

LUMBER and TIMBERS
UNTREATED OR TREATED
ROUGH OR FINISHED

FIR, PINE and HARDWOOD

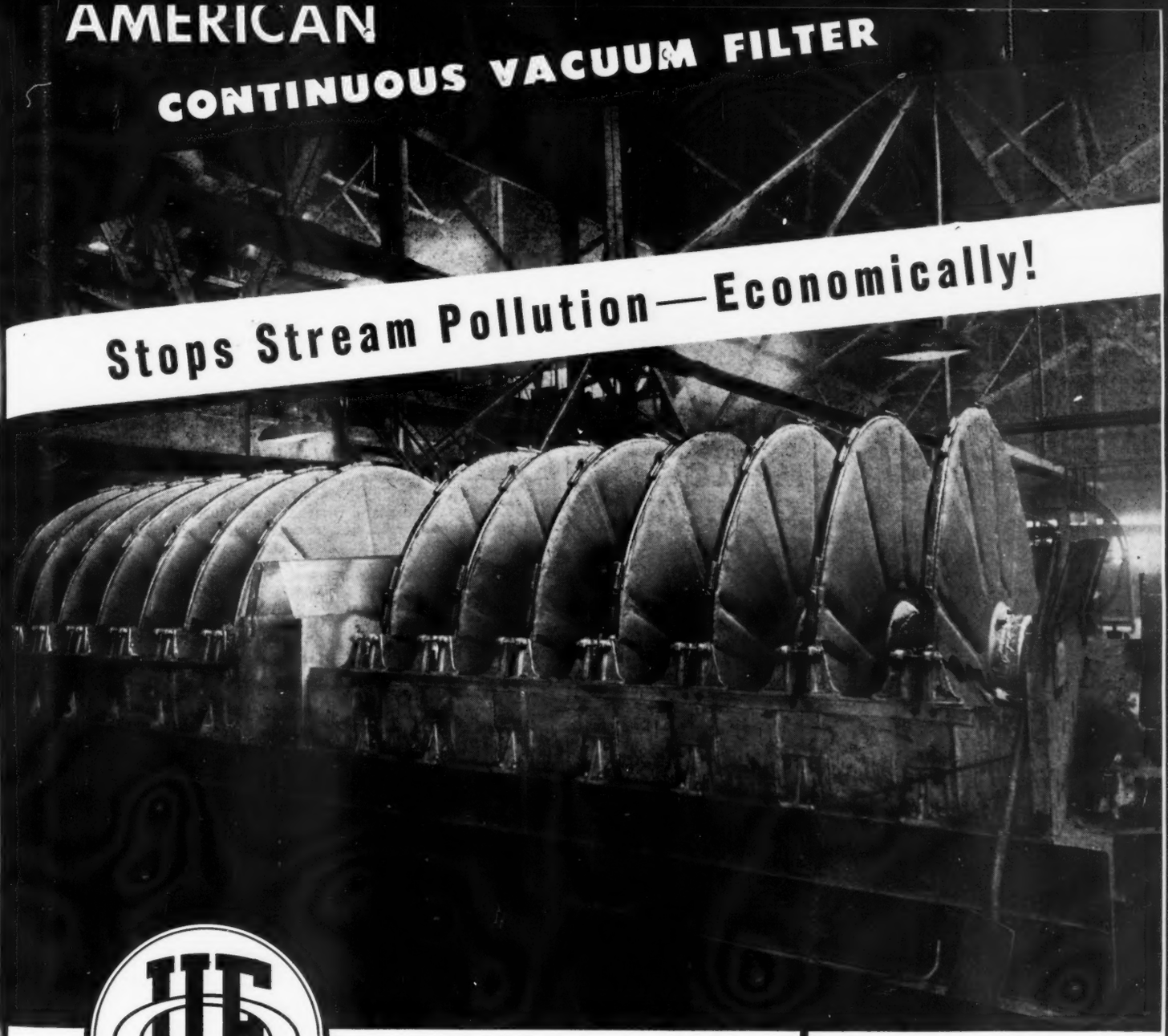
ROUNDS, POLES, PILING, PLYWOOD, MINE TIES, STANDARD TIES



YOUR INQUIRIES SOLICITED

GEORGIA-PACIFIC PLYWOOD & LUMBER CO.
formerly Georgia Hardwood Lumber Co.
GENERAL OFFICES: AUGUSTA, GA., U. S. A.

AMERICAN
CONTINUOUS VACUUM FILTER



Stops Stream Pollution—Economically!

What's the situation in your state now about allowing solids to pass down stream from the washing? Any legal restrictions? Why not stop this stream pollution positively . . . at low cost . . . and at the same time reclaim water for reuse.

For this anti-pollution job, we recommend the American Continuous Vacuum Filter which offers exceptionally high filtering capacity for floor and building space required. It's a low speed, automatic unit requiring little attention and maintenance. Numerous companies already have this filter with all reporting excellent results from the standpoint of both efficiency and economy.

Word to our nearest office about your stream pollution problem will bring prompt attention.

"40 *years of filtration experience . . . the safeguard behind all Oliver United products.*"

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

San Francisco 11
California

Chicago 1, Ill.
221 N. LaSalle Street

Western Sales Division
Oakland 1, California
2900 Glascock Street

Sales & Manufacturing Representatives:
E. Long Limited
Orillia, Canada

Factories:
Oakland, Calif. • Hazleton, Pa.
Orillia, Canada
Melbourne, Australia

Eliminates Ordinary Safety Switch Troubles

A cast iron case with rubber seal eliminates trouble from coal dust or water, yet is readily accessible. while very compact, 12"x7"x4¾", still extra large creepage insulation is provided by using ¾" mounting panel and large clearance to ground.

May be used as protective disconnecting switch for any motor in its range or for feeder protection at night when trolley line switch is opened.

A NEW FUSED LINE SWITCH

The fuses are the switch blades

The fuses are the only part which should ever need replacement. A spring brass support for these fuses gives a quick, snap type break when opened and blades are held in line at all times by copper supports. Special reinforced clips are used, held permanently in line by grooved supports with clamp type terminal in center. Either one or two fuses may be used giving ampere capacities from 70 to 200 Amps.

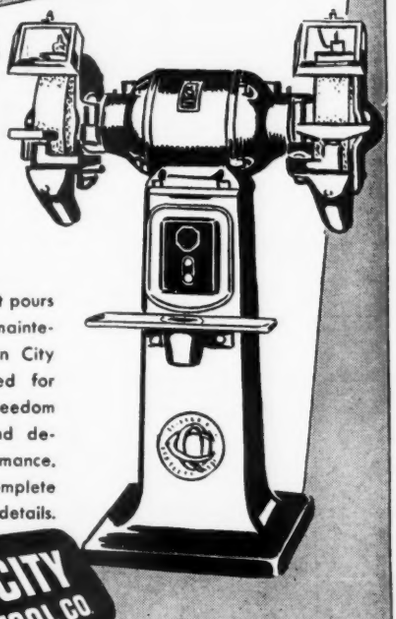
Flood City Brass & Electric Co.

JOHNSTOWN PA.

---

cut tool costs...

***with rugged* QUEEN CITY GRINDERS**



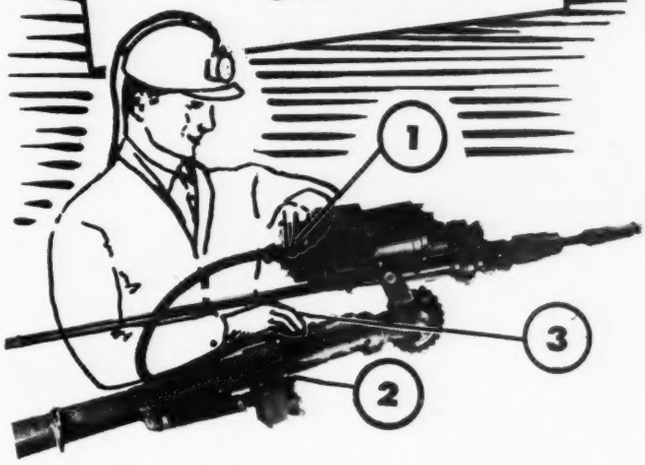
It takes a top-quality grinder to stand up under the heavy work that pours through a mine maintenance shop. Queen City Grinders are noted for their durability, freedom from downtime and dependable performance. Send for catalog complete with prices and details.

QUEEN CITY MACHINE TOOL CO

215 E. 2nd St.
Cincinnati 2, Ohio

AGENTS IN PRINCIPAL CITIES

All controls at his fingertips



With the driller controlling all operations, the new Superior 5600 drill arm and 5100 drill is tops in safety. From his position at the face, driller handles controls for:

(1) DRILL

A flip of a switch (1) operates the heavy duty, dependable 7.5 H.P. electric drill motor. Mounted on a universal swivel the drill can be swung and locked in any position.

(2) DRILL ARM

A convenient switch (2) controls actuator motor which raises and lowers drill arm. It is swung from the floor to the vertical position in a few seconds.

(3) TRAVERSE RELEASE LEVER

An easy pull of traverse pin releases lever and the drill arm can be swung 360° — eliminates set up time — gives driller full control of arm at all times.

20" high the drill arm and base plate is easily mounted on your own mobile equipment. Two heavy duty steel lock pins in arm lock provide a sure safe lock between drill arm and base plate.

FOR FULL INFORMATION ON THE SUPERIOR 5600 DRILL ARM AND 5100 DRILL MAIL COUPON TODAY!

DOOLEY BROS.
1201 S. Washington St., Peoria, Illinois.

Please send me full information ☐ literature ☐ prices ☐ on the new 5600 Drill Arm and 5100 Drill

Name_____

Title_____

Company_____

Address_____

DOOLEY BROS., 1201 S. Washington St., Peoria, Illinois

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RELEASED

UNDISPLAYED RATE:
Not available for equipment advertising
90c a line. Minimum 4 lines. To figure advance payment count 5 average words as a line.
(See ¶ on Box Numbers.)
POSITIONS WANTED (full or part-time individual salaried employment only), ½ the above rates.
PROPOSALS, 90 cents a line an insertion.

INFORMATION:
BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE
The advertising rate is $7.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

NEW ADVERTISEMENTS received by 10 A.M. December 15th will appear in the January issue subject to limitations of space available.

WANTED

—TRANSFORMERS—

TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign All Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
Station M Since 1912 CINCINNATI 27, OHIO

WANTED
Five G 12½ Goodman Shaker Conveyors A. C.
Five 212 G-3 Goodman Coal Machines.
Address WHIPPLE COALS, INC.
William S. Stewart Pineville, Kentucky

WANTED
¾ to 5 yard Shovels
2 to 10 yard Draglines
Tractors and Dozers
Frank Swabb Equipment Co., Inc.
Hazleton National Bank Building
Hazleton, Pa.
Telephones 4911 and 4910J

WANT BUY FOR EXPORT
2—6 to 10 YD. STEAM OR DIESEL OR ELEC. STRIP SHOVELS
LEONARD BURT
9075 180th St., Jamaica, N. Y.

WANTED
3 or 4 Track Steel Tipple
15 ft. railroad track centers fully equipped. Capacity 250-300 tons per hour, for coal mining company. State condition, location and price.
W 7222 COAL AGE
330 West 42nd St., New York 18, N. Y.

WANTED AIR COMPRESSORS
2—1,000 FT. TO 2,600 FT. CAP.
ADVISE WHERE INSPECT & DETAILS
DARIEN CORP., DARIEN, CONN.

FOR PROMPT ANSWERS
to your business problems
use
The SEARCHLIGHT SECTIONS
(Classified Advertising)

Air Transport	Engineering and Mining Journal
American Machinist	Engineering News-Record
Aviation Week	E. & M. J. Markets
Business Week	Factory Management and Maintenance
Bus Transportation	Food Industries
Chemical Engineering	Power
Coal Age	Product-Engineering
Construction Methods	Textile World
Electrical Construction and Maintenance	Welding Engineer
Electrical Merchandising	
Electrical World	
Electronics	

For advertising rates or other information address
Classified Advertising Division
McGRAW-HILL PUBLISHING CO., INC.
New York 18, N. Y.

CRANE WANTED
Gantry, locomotive, or crawler. Must be electric or diesel with 70 foot or longer boom with topping lift. To be used with 1¾ yard barge cleanup bucket having loaded weight of 10,000 pounds at 175 FPM on 60 foot radius. Give specifications, ratings, age, location and price in first letter.
McCRADY-RODGERS COMPANY
Pittsburgh 19, Pa.

REPLIES (Box No.): Address to office nearest you:
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

PERSONAL

If Mr. L. C. Johnson
who used to live at Box 127, St. Clairsville, Ohio, sees this advertisement, please contact Mr. Ed Degen, 637 Broadway, Hazard, Ky.

We specialize in
PATENT SEARCHES
domestic and foreign
PATENT INTELLIGENCE CORPORATION
954 Warner Bldg., Washington 4, D. C.

FOR SALE
Modern Coal Tipple and Loading Ramp complete with McLanahan & Stone Crusher, picking table, vibrating screens and 100-ton storage bin. Capacity 500 tons daily. Located near Ashland, Kentucky. For further details write to:
Box 138, Middlesboro, Kentucky

FOR SALE:
Joy Timber Setter
Type TS2-2PE, 250V, DC Boom height 8'. Serial No. TS-121. This machine was delivered in September and is as good as new.
FREEPORT GAS COAL CO.
1153 Terminal Tower Cleveland, Ohio
Phone: Main 3171

FOR SALE
2 yd. Osgood 1006 Shovel.
2 Portable GM diesel 30 KW Generator Sets, AC. Pioneer Core Drilling Outfit.
New Single Drum Hoist with 25 HP gas engine.
MICHAEL BERNHARDT,
316 Chaces Bldg. Coshocton, O.

FOR SALE
6,400 Ft. 26" 4-Ply Rubber Covered Conveyor Belting, ⅛" Top and 1/32" Bottom Covers. Mildew treated.
A. J. SKIPWORTH
Dunmor, Kentucky Phone 26

HOIST FOR SALE
200 H.P., single drum 8' dia. x 5'6" long, complete with automatic electric controls and air operated post brake. Location change makes this excellent hoist available.
G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

FOR SALE
One complete Power Unit—With Steel Building
Specifications:
100 KW Gen. G.E. 550 Volts DC
220 HP Foos Natural Gas Engine 600 RPM
CLAWSON'S WELDING SERVICE
Indiana, Pa. Phone 1989

250-VOLT BALL-BEARING LOCOMOTIVES

3—6-ton General Electric, Type HM-821.
5—6-ton General Electric, Type HM-801.
4—6-ton Westinghouse Type 905-C.
3—8-ton General Electric, Type HM-822.
4—8-ton Goodman, Type 32-A-1-4-T.
3—8-ton General Electric, Type HM-819.
2—8-ton General Electric, Type HM-707.
4—8-ton General Electric, Type HM-839.

The above Locomotives are from 36" to 48" gauge. All are equipped with CY-21 motor-driven gathering reels and 500' of practically new cable. All are rebuilt. Can make immediate shipment.

AC CUTTING MACHINES

4—Jeffrey 35-BB, 3 phase, 60 cycle, 220/440 volt, on self propelled trucks, reel and cable.
5—Goodman 112-CG-3A, 3 phase, 60 cycle, 220/440 volt, on self-propelled trucks, reel and cable, 7½' cutter bar.
5—Goodman Universal, 112-G3, 3 phase, 60 cycle, 220/440 volt, on self-propelled trucks.

LOADING MACHINES

1—L-500-B Jeffrey Loading Machine, Serial No. 23255, 250 volt DC.
4—12-BU Joy Loading Machines, 250 volt DC., all purchased new in 1944, used very little.
2—8-BU Joy Loading Machines, 250 volt D.C.
5—7-BU Joy Loading Machines, 220/440 volt AC.
3—8-BU Joy Loading Machines on cats., 42" gauge, 220/440 volt AC.
6—7-BU Joy Loading Machines on cats., 42" gauge, 220/440 volt AC.


Frank J. Wolfe

We specialize in buying complete mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.

COAL MINE EQUIPMENT SALES COMPANY
306-307 BEASLEY BUILDING L.D. PHONE 34 TERRE HAUTE, INDIANA

Wagner
"CERTIFIED REBUILT"

M-G SETS—AC to DC
250 KW Allis Ch. DC 250 V., synch. motor 440 V.
150 KW Cr. Wh. DC 250 V., synch. motor 440 V.
100 KW Whse. rotary converter, 250 V. DC output.
80 KW Star DC 250 V., synch. motor 440 V.

D.C. MOTORS—230/250 V.
150 HP Cr. Wh. b.b. TEFC 890 RPM.
100 HP Whse. SK 181 450/900 RPM.
80 HP G. E. CDM 1,800 RPM, b.b. drip (2).
75 HP Cr. Wh. CMC, 1150 RPM, b.b.
75 HP Allis-Ch. E, 500 RPM, auto starter.
60 HP Whse. SK 1700 RPM.
50 HP G.E. CD 123 850 RPM.
40 HP Whse. SK110L 1700 RPM.
40 HP Whse. SK133 850 RPM.
25 HP G.E. CD85, 1750 RPM.
25 HP Whse. SK 1100 RPM.
15 HP Whse. SK 850 RPM. (5).

Complete Stock A.C. Motors—New and Rebuilt Up to 500 H.P.—Sq. Cage, Slip Ring, Synch.

SPECIAL—600 H.P. G.E. slipring motor 360 RPM, 3/60/440 V.

Gear Head Motors Speed Reducers Pumps—Blowers
WRITE — WIRE — PHONE

ARTHUR WAGNER CO.
1433 W. Randolph St. Chicago 7
ELECTRIC MOTORS · GENERATORS

Autocar dump trucks (4), 10-yd., gas., 1946.
Shovels - Cranes, 1¼, 1½, 2, 2½, 3, 4-yd.
Draglines, 3-yd. Diesel, 3½-yd. electric.
Plymouth 10-ton gas locomotive, 36" gauge.
Locomotives, gas, 30, 20, 12, 8, 7, 5-ton.
Porter, Vulcan 18-ton steam locos., 36" ga.
Power Plant, steam-elec., 1,500 KW, complete.
B-Erie 2-1/3 yd. shovel front att., (52B-55B).

H. Y. SMITH CO. 828 N. B'way, MILW. 2, WIS.

AIR COMPRESSORS:
12—Belted, 380, 676, 870, 1,000, 1,300 ft.
12—Diesel, 105, 315, 520, 676 & 1,000 ft.
6—Electric, 1,300, 1,500, 2,200, 5,000 ft.

CARS & LOCOMOTIVES:
80 Ton Whitcomb Diesel-Elec. Locomotives.
100—50 ton cap. Gondolas.
35—50 ton cap. Flat Cars.
8—100-ton, 45-ton, 30-ton Diesel Locomotives.
50—20 yd. cap. Air Dump Cars.
6—10, 16, 20 & 30 ton Gas Locomotives.
150—8,000 & 10,000 gal. cap. Tank Cars.
20—12 yd. Std. ga. Steel Dump Cars.

ELECTRIC LOCOMOTIVES:
15—3, 5, 8 ton Battery & Trolley.

DIESEL GENERATORS:
12—100, 150, 180 & 480 K.W.

MINE LOADERS:
17—GD9. Eimco 21, Conway 20, 50, 60 & 75 and Sullivan HL3.

STEEL TANKS:
6—50,000 and 100,000 gal. Tanks on tower.
30—8,000, 10,000 and 20,000 gallon capacity.
9—80,000 & 20,000 bbl. cap.

SHOVELS—DRAGLINES:
7—1 yd., 1½ and 2 yd. Gas & Diesels.
16 yd. Elec. 160 ft. Boom Dragline.

WANT BUY
Air Compressors and Locomotives.

R. C. STANHOPE, INC.
60 E. 42nd Street New York 17, N. Y.

HIGH GRADE TOOLS

14x18x72 Gallmeyer Livingston Surface Grinder.
±3-12 Arter Surface Grinder.
±500 U K Hanchett Face Grinder.
24", 36" & 42" Bullard Vertical Turret Lathe.
±33 Lucas Horizontal Boring Mill.
2' to 7' Plain Radial Drills.
16" and 24" G & E Shapers.
New No. 3-4-5 Davis Keyseating Machine.
18"x54" centers Lodge & Shipley, late type, Lathe.
±4 Cincinnati Vert. Miller, late type.
120 A 51 Gardner Opposed Wheel Grinder.
20" Cincinnati Univ. Shaper, late type.
16"x8' American Screw Cutting Engine Lathe.
±2M Cincinnati Vert. Mill.

Also various other machine tools.

Send us your inquiries

Cincinnati Machinery Company, Inc.
217 E. Second St. Cincinnati 2, Ohio

MINE HOIST: All steel construction, single drum, 8' dia., 3,700 ft. 1½" rope, single line pull capacity 73,000 lbs. with herringbone gears to operate at a speed of 200 or 600 FPM; motor 400 H.P., 580 RPM, 3 phase, 60 cycle, 2,200 volt, complete with all control equipment. Condition like NEW. Located in California.

GOODRICH SUPER LONG LIFE CORD CONVEYOR BELT (NEW):
1—Piece 1014 ft.
1—Piece 1017 ft.
1—Piece 268 ft.
6 ply, 42 oz. duck, 7/32" top cover, 1/16" bottom cover, on original reels.
All NEW, NATURAL RUBBER, with or without mechanical parts.

TURBO GENERATOR: Curtis Steam Turbine driven Generator Unit, 600 KW, 5 stage, 200 lbs. steam pressure, 3,600 RPM, with condenser, General Electric Generator, 750 KVA 2,300 volt, 3 phase, 60 cycle, with exciter, piping, valves, etc.

PUMP: Worthington 40 H.P. steam driven Centrifugal Pump, 300 lbs. steam pressure, 3,550 RPM, with steam regulator. Complete, in new condition.

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phones: Madison 8300 - 8301

ELECTRIC LOCOMOTIVES

1—20 Ton G.E. steel frame. HM824 motors.
1—10 Ton Jeffrey, MH110 motors.
1—10 Ton West. 907 motors.
1—8 Ton G.E. HM839 motors.
3—6 Ton G.E. HM823 motors.
1—5 Ton Goodman, single motor.

COAL CUTTING MACHINES

3—35B Jeffrey Shortwall, 250 or 500 v. DC.
4—112 AB Goodman Shortwall Machines, 250 v.
2—112 AA Goodman, same as above.
2—12A Goodman Shortwall, 250 volt.
1—124 EJ Goodman slabbing machine, 250 v.
1—29 U Jeffrey arc wall.
1—7 AU Sullivan.

We have motor generator sets, rotary converters, transformers, electric motors and so forth.

TIPPINS MACHINERY CO.
PITTSBURGH 6, PA.

Electrical Equipment

Converters, Motor Generator Sets, A.C. and D.C. Motors, Control Equipment and Transformers.

We build equipment to fit your requirements. Over 25 years engineering background.

C. B. LOCKE
P.O. BOX 3227
TEL. 38-136
CHARLESTON, W. VA.

NEW and REBUILT

MOTORS
150 HP, 900 RPM, Elec. Mach. 220/3/60 Syn.
80 HP, 1200 RPM, Cr. Wh. 220/440/3/60 Ind.
75 HP, 900 RPM, Elec. Mach. 220/3/60 Syn.
75 HP, 1800 RPM, P. S. 220/440/3/60 Ind
65 HP, 1200 RPM, GE 220/440/3/60 Ind.
50 HP, 1200 RPM, GE 220/3/60 Slip Ring.
5, 7½, 10 and 15 HP new and used tefc & open.
5 to 100 HP DC motors for stock shipment.

OTHER EQUIPMENT
100 KW, 1400 RPM Whse. SK, 250 V. DC Generator.
175 KW, G.E. 300 V. 3 ph. 60 cy. 1200 RPM pedestal synch. rotary converter.
(6) 110 KVA, 2200/186/1/60 converter transformers.
60 to 90 days shipment on new transformers
Control and switching equipment in stock.

December Bargain
Immediate shipment subject to prior sale.
TRANSFORMERS
1 PH 60 CY—OISC with or without oil.

(1)	37.5 KVA GE—H. KF	1400/4160Y	—240/480*
(1)	37.5 KVA WMT	2300	—110/220**
(1)	150 KVA GE H	4000	—110/220**
(2)	150 KVA GE H.	4000	—230/460**
(2)	150 KVA GE H.	4000	—230/460**

*—Unused. **—Rebuilt.

MOTORS

(1)	150 WEN CW	2200/60/3/600	—Cont. rated shipping
(1)	200 GE 1—M	2200/60/3/600	—Cont. rated shipping
(1)	75 GE MT 356	2200/60/3/900	—Cont. rated shipping
(1)	100 GE 1—M	2200/60/3/600	—Cont. rated shipping
(1)	150 HP WEM CW	440/60/3/690	—Cont. rated shipping

Hoist control available for all of above.

E. P. DIETRICK
829 RICHMOND ST. SCRANTON 9, PA.
PHONE 3-7357

COAL MINE EQUIPMENT FULLY RECONDITIONED

COAL CRUSHERS
1—26" American Ring Type.
1—24 x 20 Jeffrey Swing-Hammer Mill.

BELT CONVEYORS
2—24" 15 to 75' Long, with Ding's Pulley.
1—30" 30' Long, with 2 H.P. Gearhead Motor. New belt.
1—30" 70' Long, with driving mechanism.
1—36" 50' Long, with driving mechanism.

MAGNETIC PULLEYS
1—24" Dia. x 26" Face Stainless Steel Ding's, 5'6" Centers, complete with mechanism, charger and 1 H.P. Gen. Elec. Gear Motor.

VIBRATING SCREENS
1—3' x 6' Single Surface Tyler-Niagara, V-belted to 5 H.P. A.C. Motor.
1—3' x 6' Single Deck Plat-O, Flat belt drive to 2 H.P. A.C. Motor.

MOTORS—AC
1—⅓ H.P. New Leland Single Phase Motor.
4—½ H.P. New Leland Single Phase Motors.
2—1½ H.P. New Leland Single Phase Motors.
2—2 H.P. New Louis Allis 3 Phase Motors.
1—3 H.P. New Leland 3 Phase Motor.
1—5 H.P. New Leland 3 Phase Motor.
2—1½ H.P. Used G.E. 3 Phase Motors.
1—2 H.P. Used Wagner 3 Phase Motor.
9—5 H.P. Used G.E. 3 Phase Motors.
3—10 H.P. Used G.E. & West. 3 Phase Motors.
1—20 H.P. Used West. 3 Phase Motor.
2—25 H.P. Used G.E. 3 Phase Motors.
2—30 H.P. Used G.E. 3 Phase Motors.
3—35 H.P. Used G.E. 3 Phase Motors.
1—40 H.P. Used Allis-Chalmers 3 Phase Motor.
1—50 H.P. Used G.E. 3 Phase Motor.
1—75 H.P. Used G.E. 2200 volt, 3 Phase Motor.

AIR COMPRESSORS
1—8⅜ x 4¾ x 5 Chicago Pneumatic, 277 Cu. Ft. Displacement. V-belted to a D-4400 Caterpillar Diesel Engine—Semi-portable.

HOISTS
1—No. 22 Vulcan, with Man Cage, 30' Steel Headframe and 40 H.P. Single Speed Elevator Type Motor, equipped with Solenoid Brake. (Hoist purchased new in 1942).
1—Single Drum Gasoline Hoist, direct connected to 2⅝ x 4¼ Wisc. Gas. Engine.
1—15 H.P. Single Drum Hoist, direct geared to motor with controller and grids.

COAL WASHING EQUIPMENT
2—Rheolaveur Launders, complete with Steel Supporting Frame.
1—60" Dia. Dividing Table, direct connected to 2 H.P. D.C. Motor.
1—Galigher Auto. Sampler with adjustable stroke and direct connected to a 1/6 H.P. Motor.
1—12' x 10' Steel Hopper Bin.
1—70' x 12' Dorr Thickener Tank, complete with mechanism.

RAILS
50 Tons—65# Relaying Rail.
15 Tons—40# Relaying Rail.
Plate Frog Switches—30# to 60#.

LARRY CARS
4—Connelsville Larry Cars, Trolley Operated, 6 Ton Capacity.

GENERATORS—DIESEL
4—D-13000 Caterpillar Diesel Generators, 75 KW, 440 Volts, A.C.

WAGON DRILLS
1—Ingersoll Rand, with drifter, all on pneumatic tires, used about 6 months.
1—Sullivan #LW-6, with drifter, on steel wheels.

STEEL TANKS
1—8'6" x 29'8" Steel Tank (Army Bolted Type) Open Top, Cap. 44,000 Gals.
1—6' x 18' Steel Horizontal Closed Tank.

SLUSHER HOISTS
1—Ingersoll Rand, 3 Drum, with direct connected 50 H.P. A.C. Motor, and 2—1½ Yd. Crescent Scrapers, unit used about 60 days.

COAL CUTTERS
2—Sullivan CE-7 A.C. Short Wall, Complete with Standard and Tip-turn Trucks, most machines with Power Cable.
New Cutting Machine Parts.

MINE FANS
1—8-H60 Jeffrey Aerodyne Exhausting Fan, with 75 H.P. Motor—Purchased new in 1942.

TROLLEY LOCOMOTIVES
2—7½ Ton Goodmans, 36" Gauge, 250 Volt D.C.

PIT CARS
150 Card Iron Works R.B. Pit Cars, 36" Ga.
1 Card Iron Works Rock Car, 90 Cu. Ft. Capacity.

MISCELLANEOUS EQUIPMENT
1—Nock & Garside Continuous Push-button Elec. Freight Elevator, with 25 H.P. A.C. Motor, Counter weights, etc.
2/0 & 4/0 Standard RC Copper Wire.
Fire Extinguishers.
Electric Mine Gongs.
1—Manierre Type Box Car Egg Loader, 18" x 12' Long belt & 5 H.P. A.C. Motor.
1—8' x 28' Double Deck Shaker Screen.
Wooden Wall Phones.
Wire Rope, ⅜" to 1¼"—new and used.
6—200 Gal. Galv. Steel Oil Tanks.
1—Jarecki Pipe Threader, ½" to 2", B.D.
1—Merriman Bolt Threader, ⅜" to 1⅜", B.D.
4—Steel Mine Cages.
3—37½ KVA Pittsburgh Transformers 440/110/220.
1—25 KW Crocker-Wheeler D.C. Generator with switchboard.
Chain Blocks, 1½ Ton to 2 Ton.

Write for Our Bulletin No. 9 and Utah List

FLORENCE
MACHINERY AND SUPPLY COMPANY

SUITE 904, EQUITABLE BUILDING **DENVER 2, COLORADO**

C. J. PARRISH, MGR.

Phone: Alpine 2803

Yards: Denver and Florence, Colorado

FOR SALE

CRUSHERS

1—McNally Pittsburg 24 x 48 multiplex single roll crusher.

1—Link Belt 36 x 60 double roll crusher, equipped with gear drive.

1—American Pulverizer crusher, No. 1627. Type AC, machine number AC3B, crushes from 20" down to ½".

1—McNally Pittsburg 30 x 54 single roll crusher.

MOTOR GENERATOR SETS

50 KW motor generator set, AC end, 75 H.P. Westinghouse squirrel cage motor, type CS, 3 phase, 60 cycle, 220 volts, 1140 RPM, ±1504169, DC end 50 H.P. Crocker Wheeler, type CCM, 230 volts, 275 amps, ±254053, complete with compensator for AC end.

50 KW Westinghouse motor generator set, DC end 250 volts, 200 amps, ±11, type S, field serial ±621994, commutator ±11-1T-135B, 860 RPM, compound wound, AC end 75 H.P. Westinghouse induction motor, type CS, 3 phase, 60 cycle, 2200 volts, 18.1 amps. per terminal, 40°C temp. rise, 870 RPM, ±4364186, complete with switchboard for DC end and compensator for AC end.

50 KW General Electric motor generator set, generator ±256064, type BR, form C, I.S. 350070-39, 200 amps, 250 volts, 1740 RPM, cont. 50°C, direct connected to 75 H.P. General Electric induction motor, type KT337-4-75-1800, form B, 3 phase, 60 cycle, 220 volts, 174 amps, 1750 RPM, ±4323202, cont. 40°C, complete with manual switchboard and compensater.

100 KW Diesel generator set, 250 volts DC, complete with switchboard.

TIPPLES

1—Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

PUMPS

All sizes and types of pumps.

MINING MACHINES

2—Sullivan type CH8, AC longwall mining machines. 3 phase, 60 cycle, 220 volt, 30" cutter bars, complete with 300' each of 3 conductor mining machine cable.

1—Jeffrey 35BB, AC shortwall mining machine, 6' cutter bar, complete with tip turn truck, cable and reel.

1—Goodman Universal mining machine, 112AA, 42" gauge, 250 volts, DC, 8' cutter bar.

HOISTS

1—Ottumwa Iron Works single rigid cylindro-conical drum hoist, serial number 4080, complete with remote control and hydraulic brakes, constructed for following hoisting conditions: Weight of cage, 6,000 lbs., weight of car, 1,600 lbs., weight of coal average 2,500 lbs., total cage travel 277 ft. (HMD) size of rope 1⅛", trips per hour 78, rest period 15 sec. Balanced hoisting without slack rope, end lift. Post brake 72" diameter, 8" face. Direct connected to Western Electric 150 HP motor, 3 phase, 60 cycle, 440 volts, slip ring speed full load 700 RPM, complete with automatic switchboard.

1—Ottumwa Iron Works single friction drum hoist, serial number 3846 driven by double reduction gears. Built for 7,000 pounds of rope pull with rope speed of 250 ft. per minute. Equipped with a drum 48" diameter, 26" face not grooved, 60" diameter band brake, 48" diameter Lane type band friction clutch. Drum shaft 5 7/16" diameter, intermediate shaft is 4 15/16" diameter. High speed pinion is mounted on the motor shaft. Complete with 100 HP GE motor ±628725, type 1-12-100A-600, form M, 3 phase, 60 cycle, 220 volts, 255 amps, speed no load 600, speed full load 570, equipped with controller and resistance.

LOCOMOTIVES

1—6-ton Jeffrey locomotive, 42" gauge.

1—5-ton Jeffrey locomotive, 42" gauge.

1—4-ton Whitcomb battery locomotive, 36" gauge.

RAILS

New 12 lb. and 25 lb. rails.

TRANSFORMERS

2—250 KVA Adams Ragnall transformers, serials 46299, 42688, 60 cycle, 13200/2400, taps 5 and 10 Pol. Add., single phase, rebuilt by Albertson Electric Company, Milwaukee, ON 23387.6.42.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

GAVENDA BROTHERS, Inc.
CANTON, ILLINOIS

SALE

PORTABLE HEATERS
Especially Adaptable for
MINE USE

STEWART-WARNER portable powerful 100,000 BTU gasoline-burning Heaters complete with turbine type blower and 1½-hp. air-cooled ball-bearing engine.

PORTABLE SELF-POWERED MANY PURPOSE HEATER

HEATING—Mills, Bunkhouses, Dry Rooms, Large Boarding Houses, Shops, Sheds, Warehouses, Buildings Under Construction, Spot Heating, etc.
THAWING—*Thawing Frozen Ore, or Preventing Freezing in Ore Bins*, Thawing Frozen Areas, Machinery, Pipe Lines, Tanks, etc.
DRYING—Drying Concentrates in Ore in Conjunction with Tumbler, Dry Wet Ore in Bins; Dry Plaster, Paint, Mortar, etc.
PRE-HEATING — Engines, Tractors, Equipment, etc.
ORIGINAL COST $583.00

SALE PRICE $195.00

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Bernstein Brothers
Since 1890
PUEBLO - Dept. M-2 - COLORADO

FOR SALE

2—150 HP. Fairbanks-Morse vertical engines with two 125 KW Gen., 250 DC., excellent condition 25 End dump Timken roller bearing cars, new sides.

1—12 BU Joy Loader, like new.

1—Set trucks for 512 Goodman Machine with pony. Numerous 5s and 10 HP. DC. Motors.

Mason & Sons Coal Co. Coshocton, O.

LOCOMOTIVES & CRANES

80 ton Lima 6 wheel Switchers. New 1944.
65 ton Whitcomb Diesel-Electric. New 1944.
50 ton Gen. Elec. Diesel-Electric.
70 ton Porter Fireless steam locomotive.
30 ton Plymouth Gas Locomotive. New 1944.
2 yd. Lima Diesel Crawler Crane. 100' bm.

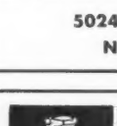
MISSISSIPPI VALLEY EQUIPMENT CO.
511 Locust St. St. Louis, Mo.

SUBSTATIONS

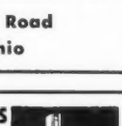
3—200 kw, 1,200 rpm., 250 volt DC, pedestal type G. E. Rotary Converters, with transformers and switchboards.
4—150 kw General Electric Synchronous Motor-Generator Sets, complete, 275 volts or 250-300 volts DC—2,300/4,000 volts AC, 3 phase, 60 cycle; 1,200 rpm. Type ATI Motor; Type MPC Generator.

Also motors, transformers & control.

R. H. BENNEY EQUIPMENT CO.
5024 Montgomery Road
Norwood 12, Ohio



TRANSFORMERS
CIRCUIT BREAKERS



NEW — REBUILT — RENTALS

1 H.P. to 2500 H.P. motors in stock
D.C. A.C., 25-50-60 Cycle

ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

CASH FOR YOUR SURPLUS

EVERYTHING FOR THE TRACK FROM
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SPECIAL OFFERING
We Offer 50,000 Good Used Creosoted Cross Ties
Immediate Shipment

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RAND BLDG. BUFFALO 3, N. Y.
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All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

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480 Lexington Ave. New York, N. Y.
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RELAYING RAIL
TRACK ACCESSORIES
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Gen. Off.: CHARLESTON 21, W. VA.
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USED D.C. MOTORS

7½ h.p. G.E. 230 v—450/1350 r.p.m. $150.
7½ h.p. G.E. 1 v—600/1800 r.p.m. $150.
7½ h.p. G.E. 230 v—1150 r.p.m. $95.
5 h.p. C-W Vertical, 230 v—960 r.p.m. $115.
5 h.p. G.E. 230 v—450/1800 r.p.m. $120.
3 hp. West. 220 v—835 r.p.m. $78.
3 h.p. R & M 220 v—1600 r.p.m. $45.
3 h.p. G.E. 230 v—1700 r.p.m. $45.
2½ h.p. G.E. 230 v—520/1560 r.p.m. $80.
1 h.p. G.E. 230 v—525/2100 r.p.m. $65.
1 h.p. G.E. 230 v—1150 r.p.m. $35.

FALK MACHINERY COMPANY
18 Ward St., Rochester, N. Y.
Main 6347-48

REBUILT EQUIPMENT—READY TO SHIP

AXIAL FLOW VENTILATING FANS

5—50" dia. 72½" long. 2 sets of propellers, 8 blades to each. Dim: of blade 14"x9½" curved mf'd by International. Size 114, driven by 100 HP., 1750 rpm, 220/440 v. 3 ph. 60 cy. A.C. Motor.
6—16000 CFM Buffalo Forge Co., 3" stat. pres. 1800/1200 rpm. con. 15/4.5 HP., 1710/1150 rpm., 3 ph. 60 cy. G.E. A.C. Motor 220/440 v. all encl.
2—12000 CFM 3" stat. pres. Sturtevant with dir. con. 10/3 HP., 1775/1180 rpm., 220/440 v. West. CS. TEFC Motor.
1—7500 cfm Clarage with dir. con. 7½ hp., 1750 rpm., 3.3 hp at 1160 rpm., 220/440 v. 3 ph. 60 cy.
31—6000 cfm. Sturtevant Bulletin 512389, 3" stat. pres. 7 blade, dir. con. 5/1.5 HP., 1765/1175 rpm., 220/440 v. 3 ph 60 cy. West. TEFC Motors.
2—5000 cfm Sturtevant 1.8 stat. pres. 4.2/1.25 HP., 1750/1150 rpm., 3 ph. 60 cy., 220/440 v. ball-bearing motors.
1—4000 cfm 3" stat. pres. Sturtevant Axial Flow vent fan dir. con. 4/1.2 HP., 1750/1150 rpm., 220/440 v., 3 ph. 60 cy. Tot. Enc. West. Motor.

HOISTS

1—Welen—2 drum 8600± per drum, each drum is 6' cir. with 430 ft. of ⅝" cable per drum can be increased to take 600'. 120 FPM per drum, driven by 25 HP., 1750 rpm., 230 V. D.C. Mtr.

HOISTS or WINCHES

200—1½-ton Hand Cranked ratio 27.1 thru an enclosed double reduction gear unit with 4 planetary gears mounted on steel plate complete with 48' of ¼" cable, ratchet type brake, push button release.

CAR PULLERS

100—Brand New with ¼" cable, 1½ and 2 ton A.C. or D.C. Motors.

LOCOMOTIVES

6 ton Atlas, 230 v. D.C.—36" gauge.

230 V. D.C. MAGNETIC STARTERS AND CONTROLLERS

456—New, 1 HP. Cutler Hammer across the line.
111—New, 1 HP. Cutler Hammer across the line.
30—New, 2 HP. Cutler Hammer across the line.
55—New, 5 HP. Cutler Hammer drip proof 2 step current limit OL and LV.
58—New 7½ HP. Cutler Hammer.
12—10/15 HP. 230 V. Westinghouse Magnetic Drip Proof Controllers, 2 steps acceleration thermal overload relay with stop, start and reset buttons.
9—New, 10/15 HP., 230 v. G.E.
10—New, 40 HP., 230 v. G.E. Magnetic.

PUMPS — with AC or DC Motors

Qua.	GPM	Head	Make
2	1300	277'	Worthington
2	1200	300	Worthington
2	1100	323	Worthington
2 New	1000	346	Worthington
1	1000	370	Worthington
2	900	365	Worthington
8	800	378	Worthington
2	800	150	Worthington
2	700	388	Worthington
2	600	182	Worthington
1	600	220	Dayton Dowd
2	600	393	Worthington
2	400	196	Worthington
1	332	202	Worthington

230 V. D.C. MOTORS

Qu.	HP	Make	Type	Speed
2	200	Reliance	1970T	400
1	150	Gen. Electric	RCP-36	1700
1	125	Westinghouse	SK-190	560
4	100	Reliance	1050T	400
2	100	Westinghouse	SK-180	640
1	100	Gen. Electric	RC-58	650
1	100	Westinghouse	SK	650
2	90	Westinghouse	SK-183	575
1	75	Westinghouse	SK-160	850
3 new	75	Cr. Wh.	TEFC	860
1	60	Westinghouse	SK-123	1750
1	60	Westinghouse	SK-153	850
2	50	Westinghouse	SK-143	850
1	35	Gen. Electric	DLC-203	700
2	35	Allis Chal.		1800
1	30	Allis Chal.		575
1	30	Westinghouse	SK-123	850

MOTOR GENERATOR SETS—250 V., D.C.

Motors: 220/440 or 2200 volts—3 phase 60 cycle.

No.	KW	Make	RPM
3	250	Westinghouse	1200
1	200	Westinghouse	720
2	200	Westinghouse	1200
1	100	Westinghouse	700
1	100	General Electric	900
1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	580
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
1 NEW	50	General Electric	1800
3	40	Westinghouse	900
2	30	Westinghouse	720

250 VOLT D.C. GENERATORS

No.	KW	Make	Type	RPM
3	250	Westinghouse		1200
1	200	Westinghouse	SK	500
1	110	Westinghouse	SK-190	700
8	100	Reliance	1050-T	580
1	100	Westinghouse	SK-183	720
1	100	Westinghouse	SK-190	720
1	100	Westinghouse	SK-180	900
6	100	Delco		1200
1	100	General Electric	RC-58	850
1	100	Westinghouse	SK	850
1	100	General Electric	RCP-36	2100
1	75	Allis Chalmers		850
2	75	Westinghouse	SK	1400
1	60	Westinghouse	SK	2100/1950
1	60	Westinghouse	SK-153	1100
1	50	Westinghouse	SK-180	400
1	50	General Electric	DLC-203	850
1	50	Westinghouse	SK-143	1100

SLIP RING MOTORS—3 PHASE 60 CYCLE

No.	H.P.	Make	RPM	Volts
1 NEW	400	Westinghouse	600	2200
1	250	Allis Chalmers	870	2200
1 NEW	200	General Electric	600	220/440
1	200	Westinghouse	1800	220/440
1	150	General Electric	1800	220/440
1	150	Westinghouse	1150	220/440
1	125	Westinghouse	860	2200/220/440
1	100	Westinghouse	720	2200/220/440
1	100	Triumph	580	550/220/440
1	75	General Electric	600	550/220/440
1	75	General Electric	720	220/440
1	75	General Electric	900	220/440
1	75	Westinghouse	1800	220/440
1	60	Westinghouse	900	220/440
1	60	General Electric	720	220/440
2	50	Westinghouse	870	220/440/2200

ENGINE GENERATOR SETS

10—NEW 1 kw 14.25 v. D.C. and 2 kw. 28.5 v. D.C. Homelite portable gas eng. Gen. sets. Can furnish lamps and batteries. Suitable for farms and camps.
3—5 kva. 120/240 v. 1 ph. 60 cy. Witte Diesel.
30—NEW 25 kva. West. 120/208 v. 1 and 3 ph. 60 cy. LeRoi GAS.
12—100 kw., 240/120 v. Delco 1200 rpm., dir. driven by 150 HP. Superior GBD-8 5½"x7" 8 cyl. DIESEL.
1—125 kva. G.E. 220/440 v. 3 ph. 60 cy., dir. con. Skinner UNIFLOW Engine.

SPECIAL BARGAIN

100 KW. Diesel Engine Generator Sets
11—100 kd., 250-275 v. D.C. Delco Generators dir. con. to 150 HP., GBD-8, 5½x7, 8 cyl. Superior Diesel Engines, elec. starting with muffler, power panel and accessories. ALMOST NEW—ONLY USED AS SPARES.

BRAND NEW TURBO SET

Westinghouse Steam Turbine consisting of 200 kw., 220/440 v., 3 ph. 60 cy. 1200 rpm., 80% P.F. A.C. Generator—40 kw., 120 v. 1200 rpm., D.C. Exciter and Westinghouse Reduction Gear.—Non-condensing. Send for Catalog.

SPECIAL BARGAIN AIR COMPRESSORS

5—240 CFM Westinghouse type 3 VS-23 3 cyl. vert., 150 lbs. pres. dir. con. to 50 HP., 220/440 or 2200 v. 3 ph. 60 cy. West. Slip Ring Motors, auto. Control. Can furnish D.C. Motors or Oil or Gasoline Engines if desired.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

Write for New Stocklist — Montrose — 5800

REBUILT MINING MACHINES

2—112 A. A. Goodman Universal, D.C.
3—112 G-3-A Goodman Universal, 220 v. A.C.
2—112 G-3 Goodman Universal, 220 v. A.C.
3—35 B Jeffries Machines, 250 v., D.C.
6—CE Sullivans Machines, A.C. & D.C.
1—7B Sullivans Machine, 250 v., D.C.

LOCOMOTIVES

2—6-Ton Goodman type 33, Ball Bearing.
1—8-Ton Goodman type 32, Ball Bearing.
2—5-Ton Goodman type 2600, Ball Bear'g.
1—6-Ton G. E., 42-inch gauge.
1—5-Ton Maucha Storage Battery Locomotive, 42-inch track gauge, height 43". Complete with Storage Battery and Charging Panel.
2—6-Ton Westinghouse, Ball Bearing.

LOADING MACHINES

2—8 B.U. Joy, 42 in. gauge on Cats., D.C.
3—5 B.U. Joy, 42 in. gauge on Cats., D.C.

THOMAS GILLESPIE & SON
State Rd. 67 — Bicknell, Ind.
Phones 179 and 140 L. and 149 K.

MOTOR GENERATORS

500 KW G.E. SYN. 275 V. 2300/4000 V. 3 PH. 60 CY. 900 RPM. SWITCHGEAR.

500 KW G.E. SYN. 575 V. 2300/4000 V. 3 PH. 60 CY. 900 RPM. SWITCHGEAR.

400 KW WEST. SYN. 575 V. 2300/4000 V. 3 PH. 60 CY. 720 RPM. SWITCHGEAR.

300 KW G.E. SYN. 275 V. 2300 V., 3 PH. 60 CY. 1200 RPM. SWITCHGEAR.

150 KW G.E. SYN. 275 V. 2300/4000 V. 3 PH. 60 CY. 1200 RPM. SWITCHGEAR

SYNCH. CONVERTER

300 KW G.E. 575 V. 6 PH. 60 CY. 1200 RPM. Pedestal Type. 2300/4000 V. TRANSFORMERS and SWITCHGEAR.

LOCOMOTIVES

30-T Jeffrey 250 V.MH-77 Mts. 48"-36" Ga.
20-T Jeffrey 250 V.MH-77 Mts. 48"-36" Ga.
13-T Jeffrey 250 V.MH-110Mts. 42"-32" Ga.
10-T Jeffrey 250 V.MH-110Mts. 42'-32" Ga.
8-T West 250 V. 906-C Mts. 44"-36" Ga.
6-T West. 250 V. 903-B Mts. 32"-22" Ga.
6-T G.E. 250 V.HM-701 Mts. 32"-24" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK CO.

501 Grant Building — **Pittsburgh, Pa.**

LOCOMOTIVES — CARS

80 ton Whitcomb Diesel Elec. Loco.
65 ton G.E. Diesel Elec. Loco.
2—50 ton New 1942, 0-6-0, S.T. Locos.
60 New 9900 Gal. Cap. Tank Cars.

R. C. STANHOPE
60 E. 42nd St. — New York 17, N. Y.

PIPE — MACHINERY — GAS ENGINES
AIR COMPRESSORS — DIESELS — PUMPS
Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO — **Near Toledo**

IMMEDIATELY AVAILABLE—MINING EQUIPMENT

MINING MACHINES

Jeffrey: 2—35B and one 35BB, 220 volt, 3 phase A.C. 28A, 250 V. 1—24B Low Vein. 4—29B, 29C, 29CE with shearing head. Also 1 on cats. Revolving head for 29C. 2—Longwall 24B.
Goodman: 12A, 12AB, 12AA, 12G3A, Shortwalls. 124 FJ Slabbers.
1—12G3, 220 volt.
1—Hitch Cutter for Cross Head timbers.
2—Goodman Slabbing Machines, permissible type, 250 and 500 volts.
Sullivan: CE7, CE9.

SUBSTATIONS—275 volts, D. C.

1—75 KW G. E. Rotary Converter. 250 volt D. C. transformers. 220-440—2300/4000.
1—300 KW Westinghouse 3 phase converter, 275 D. C. transformers, 4000/6000 A. C.
1—100 KW Westinghouse MG set. 275 D. C. 2300 volt A. C.
1—100 KW G. E. MG Set. 275 D. C. 440 volt A. C. in portable building.

LOCOMOTIVES

Goodman: All 250 volts.
1—6 ton, 30 B, 43". 1—5 ton, 2600-R.
1—5 ton, 8-30 36" gauge.
1—6 ton, type 8A.
Westinghouse Units: All 250 volts. 906, 103, 904 and 115. Bar steel frames 10 ton, 6 ton, and 4 ton.
G.E.: All 250 volts.
6 ton, 803, 44", rebuilt.
8 ton, 839.
1—8 ton type HM 61, 36" or 48" ga.

LOCOMOTIVES

5 ton 825, 44" and 36".
2 motors for 8 ton 839.
Jeffrey: 8 ton, 250 volts, type MH73. 1—4 ton MH 12. Locomotive, motors and Crabs and Reels for Locomotives.

SPARE ARMATURES

Jeffrey: MH110, MH79, MH73 and MH64-350 V. and 500 V. 29B, 35B and 28A, 35BB, 35A, 29C, 29L, 35L.
Goodman: 30B, 30C, 12A, 12AB, 112AA.
General Electric: 801, 819, 821, 825, 839, 61.
Westinghouse: 904, 905, 102, YR2, 115, 250 V. Bracket Type, 150 KW G. E. RCC.
Sullivan: CE7, CE9 and CE10.

OTHER ITEMS AVAILABLE

Aerial Tramways.
Belt Conveyors: 1 Bucket Elevator Conveyor.
Bit Sharpeners: 2 Sullivan, 1 Diamond.
Bond Welders: Resistance and N A sets.
Circuit Breakers: AC and DC.
Circuit Breakers: Automatic; 250 volt.
Circuit Breakers, Manual: 600 amps to 3,000 amps.
Coal Crushers: (double roll) 16"x16", (single roll) 24"x24", 18"x18", 12"x16".
1—30" Williams #3 Coal Crusher.
Conveyors: Scraper type. Apron and grate bar screening type.
Screens: 1 shaker 3 track, feeder reciprocating.

OTHER ITEMS AVAILABLE

Compressors & Jackhammers, Compensators.
Drop Bar Supports: (Gooseneck) 29B and 29C, 1 Revolving head for 29C.
Dumps: Crossover.
Field Frames.
Generators: DC 250-275 volt, 30 KW to 125 KW. 1—AC Generator, 31.3 KVA, 3 ph. 208 volt, General Electric with Exciter.
Hoists, overhead: AC 3-60-440 1 ton and 2 ton. Crabs and Room Hoists. Also single and double drum.
Lathes: 48"x14' with Taper Attachment and 3-60-220 Motor.
Loading Machines: 2—Myers-Whaley #3 and 4. 1—4BU Joy loading machine. 1—12BC Joy loading machine.
Milling Machines: horizontal and vertical.
Mining Machine Trucks and 2 on Catts. for short-wall and arc wall.
Monitors.
Motor Starters and Controllers: AC and DC. Synchronous Motor Starters, full magnetic, across the line, 3-60-4150. 2—200 H.P. and 7—250 H.P. 1—165 H.P., 440 volt for slip ring motors. 1—100 H.P., 250 volt D.C. Both reversible.
Pumps: Rebuilt and New.
Scales: Mine Car and Truck.
1—Slate Larry.
3—Car haul trip makers.
Transformers: 4—55 KVA 23,100/12,000 to 103/208. 3—35 KVA, 22,000/12,000 to 178/89 volts. 3—100 KVA 6,600/12,000 to 2,300.

GUYAN MACHINERY COMPANY, Logan, W. Va.

LOOK—BUY—SAVE

Real Bargains

G. I. OIL CANS
5-Gallon—hinged lid.

COPPER WIRE
500,000 CM Bare & Insulated.
4/0 Grooved Trolley.

MINE CARS
3-Ton, 48" Gauge, 29" high.

HOISTS
Single and Three Drum—New.

HAND WINCHES
All-Steel—Three Ton Capacity.

ROTARY CONVERTERS
General Electric, 50 KW—2,300 AC Primary, 275 DC Volts.

I BEAMS
10-Inch—Heavy Section.

ROTARY TRANSFORMERS
75 KVA—6,900 Primary, 103-206 Volts. Newly Rewound.

WELDERS
Westinghouse Gas Welders, 300 Amp—Portable.

MANSBACH METAL COMPANY

Logan, W. Va. **Phone 1071**

We Buy, Sell, Trade — What Have You?

FOR SALE

7000-ft. # 4-3/ conductor 49-strands Neoprene jacketed Portable Cable with shielding over each conductor and ground wires, type SHD, for operation at 7,500-Volts or less, on 1,000-ft. reels, priced substantially below present market.

UNIVERSAL WIRE & CABLE CO.
EAstgate 7-4777
2662 Clybourn Avenue
Chicago 14, Illinois

FOR SALE

One Allis Chalmers Steam Turbine Driven Generator, 2300 volt, 625 K.W. complete with condenser and switchboard in good running condition. Price $80.00 per ton.

DRAKE ELECTRIC SERVICE
Marshall, Illinois

FOR SALE

4 Goodman Style G20B77 permissible Shaker Conveyors, latest type with 300 ft. size 3 troughs, manual Type HAD duckbill and 20 HP Westinghouse AC motor, 3 phase, 60 cycle, 220 volt, 1160 RPM.
4 Sullivan Class 7B Cutting Machines, with 50 HP AC motor, 3 phase, 60 cycle, 220 volt, and Bowdil cutter bar and chain, 9 ft. long, 5" kerf.
4 Chicago Pneumatic Style 574-700 post mounted coal drills, 220 volt, 60 cycle, 3 phase, AC.
All of above to include usual accessories and guaranteed to be in A-1 condition. New in 1943.

KAISER COMPANY, INC.
Iron & Steel Division
Sunnyside, Utah

LOADERS

2—Myers-Wholey, Track Gauge 42", capacity 45 cubic ft., per minute loose material. #1 completely overhauled, excellent condition, $4,800.00. #2 Fair condition, $1,000.00. Both available immediately.

HANLEY COMPANY
Summerville, Pa.

FOR SALE

One Goodman Mfg. Co. 8-ton 50 HP, 250 volt—D/C haulage locomotive—type 32-04T—Ser. #3983—36" gage—48" wheelbase outside frame—drum type controller—mechanical brakes two headlights—with 1 General Elec. Co. independent motor driven cable reel—type MVR—Form 40—500'—#3 all rubber covered cable. Available immediately.

Jefferson Island Salt Co.
Jefferson Island, Louisiana

LEEK FOUNDRY & MACHINE CORP.

DAYTON
Gray Iron
Machine Work

Brass
Mine Cars Built to Order
Welding

PENNSYLVANIA
Aluminum Castings
Woodworking

FOR SALE

5—No. 3 Whaley Automats, 42" gauge, 250 volts D.C., non-permissible, in good operating condition.

HANNA COAL COMPANY
St. Clairsville, Ohio

MOTORS and ELECTRICAL EQUIPMENT

ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

SQUIRREL CAGE MOTORS 3-PHASE 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM.
1	30	Whse.	CS	550	900
2	40	Al. Ch.	AR	440	860
1	40	Master	PA-445	440	1200
3	50	Whse.	CS	440	690
1	50	F.M.	H-16-A	440	900
1	50	Al. Ch.	AR-220D	440	1155
1	50	Ideal	AT-445	440	1750
1	60	Whse.	CS-607	440	880
1	75	G.E.	KT-356	440	860
1	75	G.E.	KF-542	440	1200
1	75	WHSE.	CS	440	1750
7	75	Al. Ch.	AR	2300	1765
5	100	F.M.	HS-201C	440	880
1	100	WHSE.	CS-760	2300	1170
2	100	G.E.	KT-556	2200	865
2	100	G.E.	K-544	2300	1175
1	100	Al. Ch.	AR	2200	1160
1	100	G.E.	I-K	440	1800
3	100	WHSE.	CS-663	440	1750
2	125	Al. Ch.	AR	440	435
1	125	WHSE.	CS-761	440	1750
1	125	WHSE.	CS-7725	2200	1170
1	150	G.E.	I-K	440	690
1	150	El. Mchy.	B B	440	1200
1	150	WHSE.	CS-7729	2200	1170
1	200	Al. Ch.	AR	440	600
1	250	WHSE.	CS	2200	1200

TRANSFORMERS (OIL COOLED) 1 PHASE—60 CYCLE

Qu.	K.V.A.	Make	Voltage
2	10	WHSE.	2400-480/240
2*	18	KUHLMAN	480/240
1	25	ALLIS. CH.	2300-460/230
1	30	G.E.	2200/1100-608
3*	37.5	WHSE.	460/230-230/115
3	50	ALLIS CH.	22000-220
2	50	WAGNER	13200/11880-575/287
14 (NEW)	100	G.E.	4330/4160-125/250
3	130	G.E.	1900/9500-2200/550
3 (NEW)	150	WAGNER	8080/4400-2300
3	667	G.E.	2300/4000Y-460

*—AIR COOLED.

SLIP RING MOTORS—CONSTANT DUTY 3-PHASE 60-CYCLE

Qu.	H.P.	Make	Type	Volts	RPM.
2	5	Al. Ch.	ARY	440	680
1	7½	G.E.	MT	550	870
1	10	Howell		440	600
1	15	G.E.	MT-322	440	845
1	15	Whse.	HF	440	1150
2	15	G.E.	I-M	220	1125
1	20	G.E.	MT-326	220	850
4	25	G.E.	MT-526	440	840
1	25	G.E.	MT-332	2200	850
1	25	Al. Ch.	ARY	2200	860
2	25	Whse.	CW-4810	220	1750
1	30	Whse.	CW	440	1160
1	40	Al. Ch.	ARY	2200	435
3	40	G.E.	MT-346	550	560
3*	40	G.E.	I-M	600	1170
1	50	Al. Ch.	ARY	2200	490
2	50	G.E.	MT-536	2200	1150
1	75	G.E.	I-M	220	695
1	100	Whse.	CW-854C	550	690
1	125	Al. Ch.	ARY	440	900
1	150	G.E.	I-M	440	1180
1	150	G.E.	I-M	2200	1750
1	200	G.E.	I-M	2200	600
1	200	Al. Ch.	ANY	2200	600
1	250	Whse.	CW-1106	2200	580
1	300	Al. Ch.	ANY	2200	505
1	300	G.E.	I-M	2200	1200
1	400	G.E.	I-M	2300	900
1**	450	G.E.	MT	2200	257
1**	600	G.E.	MT-412Y	2200	719
1**	750	G.E.	MT-414Y	2200	709
1**	1200	Whse.	CW	2200	590

*40 CYCLE.
**—MILL TYPE 2-PEDESTAL BEARING ON ANY CAST IRON BASE COMPLETE WITH REVERSING PRIMARY AND MAGNETIC SECONDARY CONTROL.

Can supply control, MANUAL or MAGNETIC CONTROL for any of the above motors ENGINEERED to your requirements.

SLIP RING MOTORS—CONSTANT DUTY 3-PHASE 60-CYCLE

Qu.	KW	Make	RPM	Volts D.C.	Volts A.C.
1	5½	G.E.	1800	250	220/440
1	9	G.E.	1800	250	220/440
7	25	Whse.	1200	120/240	220/440
3	50	Whse. (3-Unit)	1200	120/240	440/2200
2	35	G.E.	1800	125	220/440
1	50	Lo. Al.	1200	120/240	440/2200
1	75	Whse.	1200	125	220/440
1	75	Al. Ch.	900	250	2200
1	100	G.E.	1200	250	440/2300
1	100	C.W.	1200	250	440/2300
3	150	C.W.	1200	300	440/2200
1	300	Whse.	1200	125/250	2300
1	400	Whse.	720	550/275	2300
1	600	G.E.	720	300	2200
2	1000	G.E.	514	600	4150/2300

Above furnished complete with A.C. and D.C. panels and A.C. control.

ROTARY CONVERTERS

2025/2565 K.W. 225/285-V.D.C., G.E., 9000-Amp., 450-R.P.M., with booster.
2760—K.V.A. Transf., 6900-V., 3-PH., 60-CY., complete control, & D.C. distribution cubicles.

SYNCHRONOUS MOTORS — ALTERNATORS 3-PHASE 60-CYCLE

Qu.	H.P.	Make	P.F.	Volts	RPM
2	200	Al Ch.	1.0	2300/440	360
1	30	Whse.	.8	220	1800
2	50	G.E.	.8	2200	600
1	60	G.E.	.8	440	1200
2	100	G.E.	.8	440	600
1	100	Ideal	.8	220	900
1	100	Whse.	1.0	2200	1200
3	100	Whse.	.8	440	1800
1	125	G.E.	.8	2200	900
1	150	G.E.	1.0	2300	900
1	220	G.E.	.8	480	720
2	200	Al. Ch.	1.0	2300/440	360
1	400	Whse.	.8	440	600

(3)—**NEW** 1000-K.W. generators or **1250-HP., Syn. Motors.** G.E. type A.T.I., 4160/2300-V., 3-PH., 60-CY., 900-R.P.M., dir. con. exciters, pedestal bearing design. Can furnish control equipment and panels.

T. B. MAC CABE COMPANY.

4314 CLARISSA STREET — PHILADELPHIA, PENNA.

IMMEDIATE SHIPMENT AT REDUCED PRICES

Conveyor for mines and tipples priced from	$ 665.00
Picking table, with motor and 48" belt	1,100.00
Stoker Coal crusher	474.00
Large coal crusher	1,074.00
15-ton truck scale	450.00
20-ton truck scale	510.00
33-ton truck scale, 34' platform	1,650.00
5-ton tipple scale	312.00
Vibrating screens, 2' to 5' wide, many lengths, 1 to 5 decks. All with screen cloth or plates to customers' specifications. Priced from	395.00

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Phone Garfield 2186 — University 2832 Evenings

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton 13" to 56" Track Gauge

GREENSBURG MACHINE CO.
Greensburg, Pa.

—RECLOSING BREAKERS—

1,500 Amp. on Panels (War Surplus)
G.E., West., C-H.
$250 EACH

S. M. DAVIS
510 Lasalle, St. Louis 4, Mo.

LOCOMOTIVES FOR SALE

2—65 ton, WHITCOMB diesel-electric, new 1943, 566 HP, tractive effort 43,300 #.
1—45 ton, DAVENPORT diesel-electric, new 1942, four traction motors, railway type, Cooper Bessemer diesel unit, rear end cab.
1—44 ton, GENERAL ELECTRIC diesel-electric, built new October, 1944, 380 HP, four traction motors, Caterpillar D-17000 diesel units.
1—35 ton, PLYMOUTH diesel-mechanical, powered by Cummins Model L1-600 unit, excellent condition.
1—25 ton, GENERAL ELECTRIC diesel-electric, new 1942, powered by Cummins Model HB1-600 unit, one traction motor, tractive effort 16,000 #.
2—50 ton, PORTER steam side tank type switching locomotives, new in 1943, pressure 210 #, tractive effort 21,600 #.
2—80 ton, LIMA type 0-6-0 steam switchers with tenders, new 1944, tractive effort 40,000 #, 21"x28" cylinders.

LOCOMOTIVE CRANES

1—ORTON 15 ton capacity, new 1942, steam double drums. Excellent.
2—OHIO 35 ton capacity, new 1943, gasoline powered, 60' booms, double drums outriggers.
1—OHIO 35 ton Model G, new 1942, steam operated, coal fired, 55' boom, double drums, outriggers.

CARS

4—20 cu. yd capacity Austin Western air dump cars, cast steel truck side frames, will interchange.
16—50 ton capacity twin hopper cars, all steel, class "HD," all standard accessories, will interchange.
40—All steel 30 ton capacity gondolas, new in 1945. Cast steel truck side frames, will interchange.

Our stock includes many other locomotives, cars, cranes and heavy equipment items.
We invite your inquiries.

Write — Phone — Wire

PAN-AMERICAN ENGINEERING CO.

P.O. Box 2576 — Telephone L.D. 339
Dallas, Texas

CRAWLER AND LOCO CRANES

1—25 ton Marion Diesel Crawler, 1½ yd. shovel front D/L attachm'ts. 60' bm. D13000 Caterpillar Diesel engine, 33" cat., first class condition.
1—¾ yd. same as above, Marion No. 332.
2—¾ yd. Buckeye Gas Shovels and Cranes.
1—Link Belt K45 Crane and D/L 70' bm. Wisc.
1—2½ yd. Koehring Diesel D/L Crane with 80' boom.

MINE AND SLOPE HOISTS

1—40000± Vulcan Dbl. Drum AC.
1—35000± Nordberg Sgl. Drum AC.
1—10,000 lb. cap. Vulcan Sgl. Drum Hoist 4' x 4" drum 250 HP, AC.
1—5,000 lb. cap. Lidgewood Sgl. Drum Electric Hoist, 600 FPM, GE motor, 100 HP, AC.

HOIST MOTORS

1—200 HP, GE 2300/3/60 AC 585 RPM Motor with control.
1—225 HP, GE Motor for 440/3/60 AC, 585 RPM with control.
1—300 HP new Allis Chalmers slip ring motor, 600 RPM for 2300/4000 AC.

CONVEYORS

1—1275 ft. 42" belt Conveyor with drive.
1—300 ft. 60" ditto.
1—275 ft. 48" ditto.

CRUSHERS

1—24 x 24 Bbl. Roll Crusher.
1—4" x 8" Sturtevant Mill Roll Jam Crusher, complete with belt drive, but less motor, NEW.

DIESEL MOTORS

3—6 cyl. 280 HP Cummings Diesel Motors.

GENERATING UNIT

1—750 KVA Westhse. 440/3/60 AC Generator with Nordberg Uniflow Steam Engine, complete. Bargain.

AERIAL TRAMWAY

1—Aerial Cable Tramway, 1250 ft. long x 1½" rope with haul rope. Mtr. 60 HP, AC.

COMPRESSORS

1—600 ft. Ir. 2 stage motor driven compressor, Imperial Type for 220/440/3/60 AC.
1—900 ft. Sullivan WJ Angle Compound Compressor with 150 HP, GE Motor, 220/440/3/60 AC.

DERRICKS

1—25 ton, 3 drum Stiff Leg Derrick with 90' bm., AC.

HAWKINS AND CO.

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Phone: HA. 7-0725

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n Galveston Bay, huge rotary drill-ng rigs bore nine thousand feet under he sea for oil. Long strings of pipe put remendous shock loads on wire rope. RU-LAY Preformed stands up extreme-y well even under such treatment.

Breaking up hard-packed earth is the first step in grading for water drainage in Nebraska. These earth-breaking machines put constant gruelling strains on the wire rope. Here again, TRU-LAY Preformed gives longer, lower cost service.

Hoisting a completely loaded box car onto a Sea-train for over-water journey from Edgewater, N. J., to Texas City. TRU-LAY Preformed is hard at work every day on thousands of huge overhead traveling cranes like these—giving good service.

Far down below ground in West Virginia's soft coal fields, under-cutting machines claw at the walls of coal. Here wire rope is expendable. TRU-LAY Preformed of correct construction adds many extra hours of service—lowers over-all costs.

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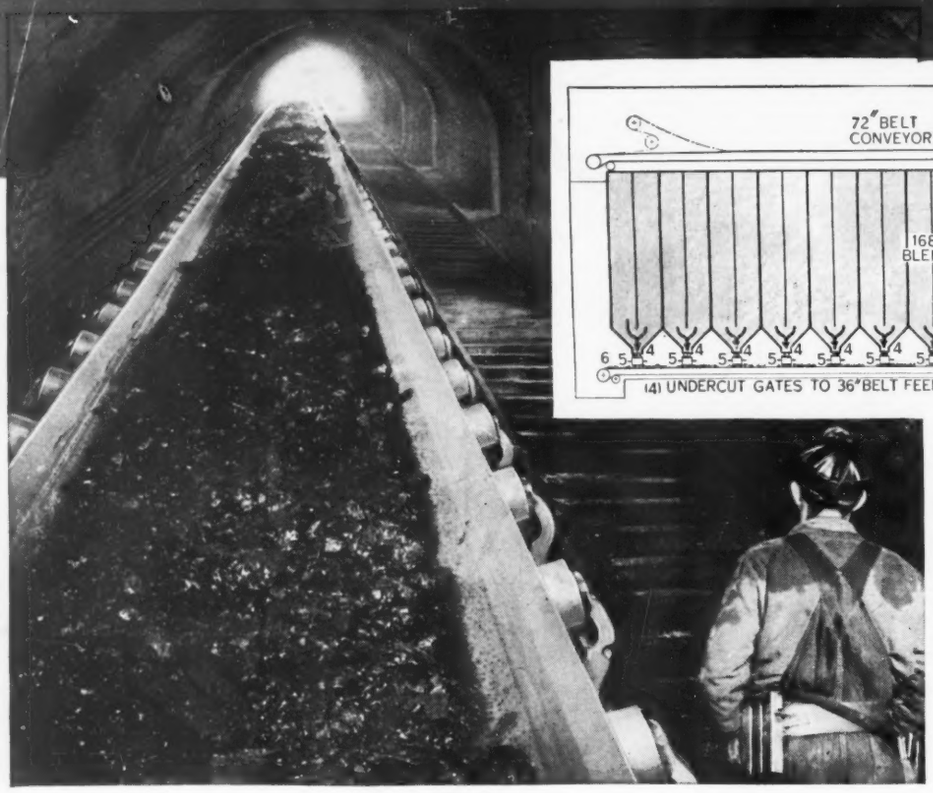
AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

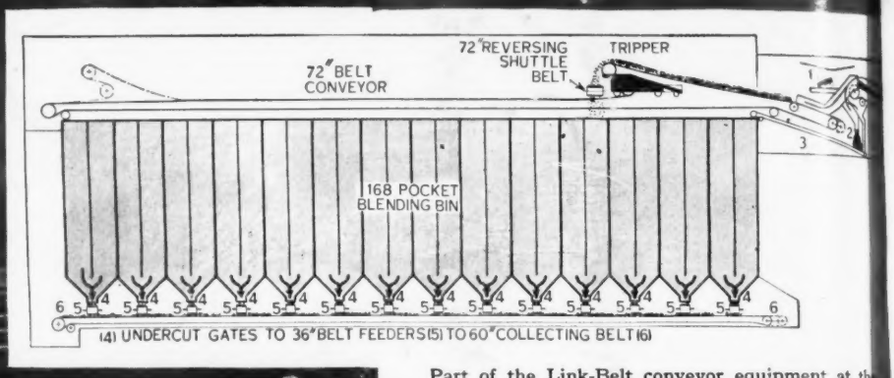
TRADE MARK

In Business for Your Safety

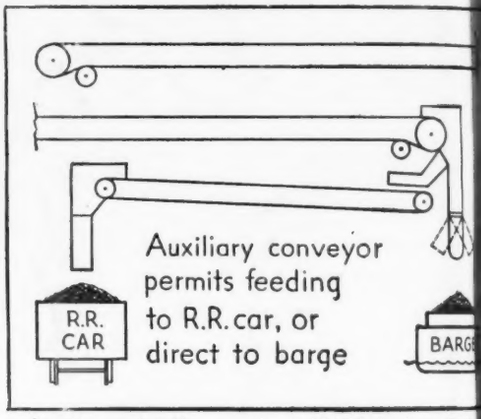
Tru-Lay *Preformed* **Wire Rope**

The Longest↔highest lift↕widest belt conveyors in Coal Mining

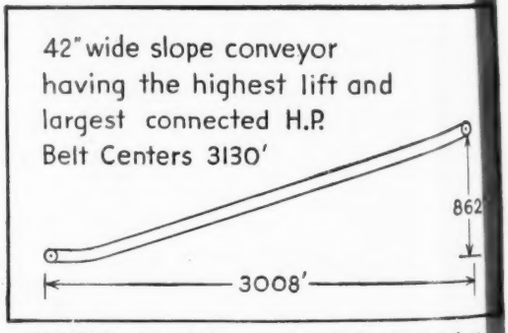




Part of the Link-Belt conveyor equipment at the world's largest coal mine—Robena Mine of H. C. Frick Coke Company. Shown above is the blending bin with a 72" wide Link-Belt conveyor for distributing coal over the 168 pockets of this bin.



Loading and delivery ends of 10,900 ft. long Link-Belt conveyor which will carry coal at the rate of 216 T.P.H., from mine, through tunnel to river at a West Va. mine.



Link-Belt slope belt conveyor to be installed at Southern Illinois mine.

Continues the trend towards continuous coal flow

Pardon the superlatives, but we can't resist the temptation to brag a little about the new heights attained by the technology of the American coal mining industry.

Link-Belt has installed, or is installing, the following in coal mining operations:

1) The longest belt conveyor (10,900 ft.). This is an installation soon to be made for a metallurgical coal mine in West Virginia.

2) A belt conveyor with the highest lift (862 ft.), for a Southern Illinois mine.

3) The widest belt conveyor (72" belt) at the world's largest coal mine—Robena Mine of H. C. Frick Coke Company.

The success of Link-Belt conveyor installations in raising production rates and cutting handling costs is due not only to the most advanced design and construction of Link-Belt manufactured components, such as carrying and return idlers, terminal and drive machinery, welded steel pulleys, and highly efficient speed reducers, but to broad engineering experience in integrating these elements most effectively.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT

COAL AGE

With Which Is Consolidated

The "Colliery Engineer" and "Mines and Minerals"

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January to December, 1948

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